

LIBRARY.  
QR. MR. GENERAL'S OFFICE.  
Rec'd. 18  
Section. Shelf.

# THE IRON AGE

A Review of the Hardware, Iron and Metal Trades.

Published every Thursday Morning by David Williams, Nos. 96, 98, 100 & 102 Reade St., New York.

Vol. LIII: No. 16.

New York, Thursday, April 19, 1894.

\$4.50 a Year, including Postage.  
Single Copies, Ten Cents.

Reading Matter Contents..... page 764  
Classified List of Advertisers.... " 99  
Alphabetical Index to Advertisers " 103  
Advertising and Subscription Rates " 785



Send for circular "I" to  
SHULTZ BELTING CO.,  
ST. LOUIS, MO.  
NEW YORK, N. Y., 225 Pearl St., A. B. Laurence, Mgr.  
BOSTON, MASS., 184 Summer St., G. J. Kelley, Mgr.  
PHILADELPHIA, PA., 129 N. 3d St., J. Garnett, Mgr.

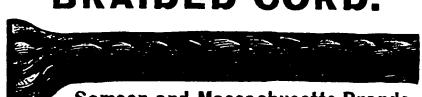
**TUDOR IRON WORKS,**  
ST. LOUIS.

Manufacturers of  
HARROW TEETH, MINING RAILS,  
SPIKES,  
TRACK FASTENINGS..

Great Reduction in Prices of Bristol's Patent  
STEEL BELT  
LACING.

  
Send for show  
card, circular  
and free samples.  
THE BRISTOL CO., Waterbury, Conn.  
New York Office, 121 Liberty St.

**BRAIDED CORD.**



Samson and Massachusetts Brands.  
Send for Samples.

**SAMSON CORDAGE WORKS, Boston, Mass.**

**TURBUCLES.**



BRANCH OFFICE: 136 Liberty St., New York.  
Cleveland City Forge and Iron Co., Cleveland, O.

Jobbers Carrying a large Stock of the Wilmot & Hobbs Mfg. Co. Celebrated Copperized Oilers. Russell & Erwin Mfg. Co., Sargent & Co., Green, Tweed & Co., Church & Sleight, Montgomery & Co., The Bigelow & Dowse Co., Frye, Philipp & Co., Baldwin, Robbins & Co., Biddle Hardware Co., Horton, Gilmore, McWilliams & Co., Hibbard, Spencer, Bartlett & Co., Fairbanks, Morse & Co., Charles H. Besley & Co., A. F. Shapleigh Hardware Co., L. M. Rumsey Mfg. Co., M. M. Buck & Co., Cahill, Collins & Co., The Geo. Worthington Co., McIntosh, Huntington Co., Fletcher Hardware Co., Buhl Sons & Co., John Pritzlaff Hardware Co., Rundell-Spence Co., Howell, Gano & Co., Hart Hardware Co., W. B. Belknap & Co., Layman, Carey & Co., Patrick & Little Co., Knapp & Spaulding Co., A. Tredway & Sons Hardware Co., Richards & Chawner Hardware Co., Rector & Wilham Co., Hendrie & Bolhoff Mfg. Co., Baker & Hamilton, Hobbs, Hovey Co., Rice, Lewis & Co., Lokenhead Hardware Co., Wood, Va. fence & Co., Caverhill, Learmonth & Co., AND MANY OTHER PROMINENT JOBBERS.

NEW YORK.

BOSTON.

PHILA., PA.

CHICAGO.

ST. LOUIS.

CLEVELAND.

DETROIT.

MILWAUKEE.

CINCINNATI.

LOUISVILLE.

INDIANAPOLIS.

DES MOINES, IOWA.

SIOUX CITY, IOWA.

DUBUQUE, IOWA.

KANSAS CITY, MO.

OMAHA, NEB.

DENVER, COL.

SAN FRANCISCO, CAL.

LONDON, ONT.

TORONTO, ONT.

HAMILTON, ONT.

MONTRÉAL, P.Q.

YOU WILL NEVER PASS A BIRD IF YOU USE

**U. M. C. PAPER SHELLS.**  
"Trap shells."

TRAP SHELLS (green color) are equal water-proofed, have an extra strong primer with WARRANTED gas tight and adapted to HEAVY load.

Imported; have conical base, are up, are METAL REINFORCED, are powders. Can be reloaded many times.

**"Smokeless Shells."**

SMOKELESS SHELLS (salmon color) are the same as the Trap Shell except that they are not metal REINFORCED, being intended for MODERATE charges only of nitro-powders, which should not exceed 3/4 drams (measure) for 12 gauge, or 3/4 drams for 10-gauge.

**"Nitro Club."**

NITRO CLUB SHELLS are designed to meet the demand for a moderate priced shell adapted to nitro-powders. Quality is the same as our celebrated "New Club" shells, but they have special strong primers (not sold except in these shells) and a new form of base, thereby giving quick ignition and strong combustion to moderate charges of nitro-powder.

**"New Club."**

NEW CLUB SHELLS are designed for use with black powders. Conical base, primed with the celebrated U. M. C. No. 2 primers. All sizes and lengths.

**The Union Metallic Cartridge Co., Bridgeport, Conn.**

**RANDOLPH & CLOWES,**

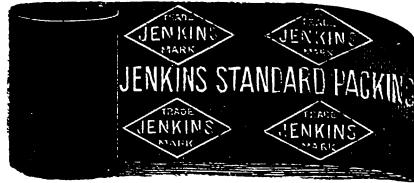
WATERBURY, CONN.

Western Depot, 71 West Washington St., Chicago, Ill.

Branch Offices: 104 John St., New York.  
213 Chestnut St., Philadelphia, Pa.  
21 Milk St., Boston, Mass.  
Room 208 Neave Building, Cincinnati, O.

**SEAMLESS DRAWN BRASS AND COPPER TUBING.**

Hot and Cold Rolled Sheet Copper and Brass of all kinds.



**JENKINS' STANDARD PACKING**

For Steam or Joint Packing has no superior. It is manufactured in all thicknesses. It is not loaded to increase weight. Does not ROT or BURN OUT. Every sheet is stamped with Trade Mark, like cut.

**JENKINS BROS.,**  
New York, Philadelphia, Boston and Chicago.

**COPPERIZED C. R. SWEDOH, ALSO NICKEL PLATED**

FOR THE CONVENIENCE OF  
RETAIL HARDWARE and MILL SUPPLY HOUSES

We have arranged with all of the principal  
Jobbing Houses in the Country to carry

**A Large Stock of our**

**CELEBRATED OILERS**  
AND QUOTE THEM AT BOTTOM PRICES.

These Oilers are very durable, substantial and beautiful, and sell at sight. The character of the Jobbing Houses fully vouches for their excellence.

Please send your inquiries and orders to your nearest Jobber and facilitate delivery and lessen transportation expenses.

**STEEL ANTI-RUST OILERS** "C. R. SWEDOH" TRADE MARKS REGD.

ALL SIZES & STYLES BURNISHED FINISH  
CHEAP & ELEGANT SCALE 1-1/2 SIZE

SCOUT  
No. 210  
No. 211  
No. 212  
No. 213  
No. 214  
No. 215

LARGE STOCK, BEST OF GOODS & FACILITIES  
THE WILMOT & HOBBS MFG. CO.

HOT & COLD ROLLING MILLS AND FACTORIES  
BRIDGEPORT, CONN. U. S. A.

STORE, 20 MURRAY ST., NEW YORK.

**Rainey Connellsville Coke.**  
The only Coke you can buy and know you are getting the best that can be manufactured. All our works in the heart of the Region, within four miles of Connellsville, Pa.

**CAPACITY 4,000 TONS DAILY.**

**W. J. RAINY,** MAIN OFFICE:  
Connellsville, Pa.  
Mercantile Bank Building.

**CLEVELAND, OHIO.**

THE  
**ANSONIA BRASS**  
**AND COPPER CO.**  
 MANUFACTURERS OF  
**BRASS AND COPPER**

Seamless Tubes, Sheets, Rods and Wire.

**Ingot Copper.**

SOLE MANUFACTURERS

**Tobin Bronze**

(TRADE-MARK.)

Condenser Plates, Pump Linings, Wire, Round, Square and Hexagon Bars, for Pump Piston Rods and Bolt Forgings.

19 & 21 CLIFF Street, - - - New York.

THE

**New Haven Copper Co.**

SOLE MAKERS OF

**POLISHED COPPER**

Under Patent of T. James, Sept. 12, 1876.

ALSO MANUFACTURERS AND DEALERS IN

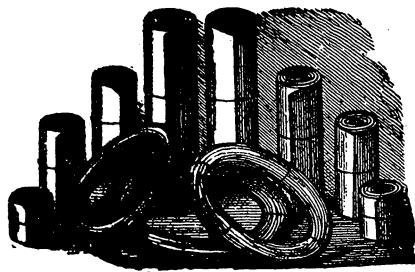
**BRAZIERS' & SHEATHING COPPER,**

Kettles, Bottoms, Bolts, Circles, &c.,

ALSO MANUFACTURERS OF

Cast Steel Augers and Bits of Superior Quality.

294 Pearl St., - - - NEW YORK.



**Waterbury Brass Co.**

Established 1845.

Sheet, Roll and Platers' Brass, German Silver, Copper, Brass and German Silver Wire, Brass and Copper Tubing,

**COPPER RIVETS AND BURS,**

**PERCUSSION CAPS,**

**TAPE MEASURES,**

**METALLIC EYELETS,**

Brass Kettles, Brass Tags, Powder Flasks, Shot Pouches, &c.,

AND SMALL BRASS WARES OF EVERY DESCRIPTION.

HICK'S PRIMERS. BERDAN PRIMERS.

**Cartridge Metal in Sheets or Shells a Specialty.**

Sole Agents for the CAPEWELL MFG. CO.'S Line of Sporting Goods.

DEPOTS:

296 Broadway, New York, 125 Eddy St., Providence, R. I.

MILLS AT WATERBURY, CONN.

WHEN IN WANT OF ANYTHING IN

**BRASS AND COPPER**

WRITE

**ROME BRASS & COPPER CO.,**

**ROME, N. Y.**

**MATTHIESSEN & HEGELER ZINC CO.,**

LA SALLE, ILLINOIS,

**SMELTERS OF SPELTER**

AND MANUFACTURERS OF

**SHEET ZINC AND SULPHURIC ACID.**

Special Sizes of Zinc cut to order. Rolled Battery Plates.

Selected Plates for Etchers' and Lithographers' use.

Selected Sheets for Paper and Card Makers' use.

Stove and Washboard Blanks.

**ZINCS FOR LECLANCHE BATTERY.**

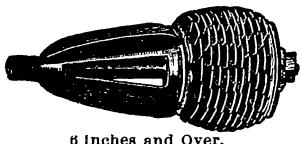
**BRASS GOODS MFG. CO.,**

Mfrs. of Stamped Brass, Silver and Nickeled Goods, Brass Labels for Cans and Rubber Moulds,

**BRONZE DOOR KNOBS**

Bronze and Plated Roses, Combined Rose and Escutcheon Plates, Socket Shells, &c., Patent Mirror Pin Cushion Business Cards, Mucilage Brushes. Novelties of new design made to order.

SALESROOM: 88 Chambers St., New York. FACTORY: 86-92 Third St., So. Brooklyn.

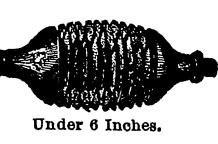


**The Peerless FLUE CLEANER,**

FROM 1½ TO 16 IN.

For descriptive circular and prices address the Manufacturer,

Jas. T. Mackay, St. Louis, Mo.



Under 6 Inches.

**HENDRICKS BROTHERS,**  
 Proprietors of the  
**Belleville Copper Rolling Mills,**

Manufacturers of  
**Braziers', Bolt and Sheathing COPPER.**  
**COPPER WIRE AND RIVETS.**

Importers and Dealers in  
**Ingot Copper, Block Tin, Spelter, Lead, Antimony, etc.**  
 49 CLIFF ST., NEW YORK.

**THE PLUME & ATWOOD MFG. CO.**

MANUFACTURERS OF

**Sheet and Roll Brass**  
 -AND-  
**WIRE,**

GERMAN SILVER AND GILDING METAL, COPPER RIVETS AND BURRS, COPPER ELECTRICAL WIRE,

Pins, Brass Butt Hinges, Jack Chain, Kerosene Burners, Lamp Trimmings, &c.

18 MURRAY ST., NEW YORK.

71 PEARL ST., BOSTON.

90 MARKET ST., CHICAGO.

ROLLING MILL,  
 THOMASTON, CONN.

FACTORIES:  
 WATERBURY, CONN.

**SCOVILL MFG. COMPANY,**

Manufacturers of

**BRASS**

*Sheet, Wire, Tubes.*

**BUTT HINGES,**

**BUTTONS,**

**LAMP GOODS,**

**NOVELTIES.**

**PURE ALUMINUM**

INGOT and SHEETS.

FACTORIES, WATERBURY, CONN.

DEPOTS:

438 Broome Street, New York.

210 Lake Street, Chicago.

29 High Street, Boston

**JOHN DAVOL & SONS,**

AGENTS FOR

Brooklyn Brass & Copper Co.,

DEALERS IN

**COPPER, TIN, SPELTER, LEAD, ANTIMONY.**

100 John Street, - - - New York.

**WILLIAM S. FEARING.**

100 Chambers St., NEW YORK,

SELLS TO THE TRADE

**Sheet Brass, Fancy Sheet Brass,**

**German Silver, Copper, Brass**

**and German Silver Wire,**

**Brazed and Seamless Brass and**

**Copper Tubes, Brass and Copper**

**Rods, Brass Ferrules,**

**Pure Copper Wire,**

**Sheet and Ingot Copper, Spelter,**

**Tin, Antimony, Lead, &c.**

**MISSOURI**

**METAL COMPANY,**

923 Security Building,

**ST. LOUIS.**

**SPELTER.**

ELEPHANT  
BRAND

ALL GENUINE  
INGOTS & MANUFACTURES  
BEAR OUR  
REG. TRADE MARKS.



**PHOSPHOR-BRONZE**  
INGOTS, CASTINGS, WIRE, SHEET &c.  
THE PHOSPHOR BRONZE SMELTING CO. LIMITED  
2200 WASHINGTON AVE. PHILADELPHIA, PA.  
ORIGINAL MANUFACTURERS OF PHOSPHOR-BRONZE IN THE UNITED STATES AND SOLE  
MAKERS OF "ELEPHANT BRAND" PHOSPHOR-BRONZE.

PHOSPHOR  
BRONZE.

**Parsons' Manganese Bronze and White Brass.**

MADE IN THE UNITED STATES EXCLUSIVELY BY

**THE WILLIAM CRAMP & SONS SHIP and ENGINE BUILDING CO.,  
PHILADELPHIA, PA.**

**MANGANESE BRONZE PROPELLERS**

— ARE USED BY THE —

Cunard, Pacific Mail, Hamburg American, White Star, International, Morgan, Canadian Pacific, North German Lloyds and many other Steam Ship Companies, and principal Naval Powers.

**Parsons' White Brass ; the Most Approved Anti-Friction Metal.**

G. DOUGLAS PETRIE, Agent,

Nos. 39 & 41 Cortlandt Street, New York.



**THE F. L. GAYLORD CO.,**  
— MANUFACTURERS —

Aluminum Bronze Castings, Aluminum Bronze Sheets, Aluminum Bronze Ingots and Pure Aluminum Castings.

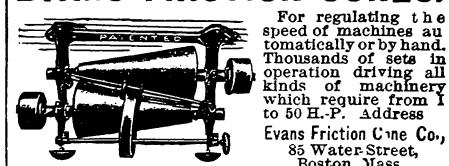
Box 1147, Ansonia, Conn.

**Rough Casting of Aluminum.**

Aluminum Bronze, German Silver Bronze and all kinds of Metals. Manufacturers of Chandlers, Metal Picture Frames, Ink Stands, Figures, Statues, etc. Star Carpet Holders a Specialty.

**St. Louis Bronze & Aluminum Works,**  
3741-3743 North Broadway,  
ST. LOUIS, MO.

**EVANS FRICTION CONES.**



**CROWN SMELTING COMPANY,**

Chester, Pa.

**Bronze, Brass and Composition Castings.**

Inventors and Sole Manufacturers of

"Crown Bronze" Bearing Metal and "Crown ROLLING MILL Babbitt Metal."

Manufacturers of PHOSPHOR-BRONZE TO PENNSYLVANIA RAILROAD.

Specifications in ingot metal or castings.

**The W. W. & R. M. KEYS CO.,**

Bronze,  
Composition  
and  
Brass  
Castings  
of all kinds,  
also  
Babbitt  
Metals

BRIDGEPORT, CONN.

**PHOSPHOR-TIN**

BY USING MY PHOSPHOR-TIN MANUFACTURERS CAN MAKE ANY DESIRED GRADE PHOSPHOR-BRONZE THEMSELVES BY THE SIMPLE PROCESS OF MELTING, MUCH CHEAPER THAN THEY ARE NOW TO BE HAD IN THE MARKET. NEW OR OLD COPPER CAN BE USED. FOR CIRCULARS AND PEARLS ADDRESS HALK & NAUMANN, NEW-YORK. SOLE AGENTS FOR THE U.S. AND CANADA. 3/5 PEARL

**The American Metal Co.**

(LIMITED),

Levin Building, 80 Wall St., New York.  
P. O. BOX 957.

COPPER, COPPER ORES AND MATTES.  
TIN, LEAD, SPELTER, ANTIMONY, NICKEL,  
ALUMINUM, BULLION, IRON.

Advances made on Consignments.

AGENTS FOR

Henry R. Merton & Co., London  
Metallgesellschaft, Frankfort-on-Main.  
Williams, Foster & Co. Ltd., Swansea.

**BEST, FOX & CO.,**  
25th Street and A. V. Ry. — PITTSBURG, PA.  
SOLE MANUFACTURERS OF  
**CLIMAX BRONZE**  
FOR ALL PURPOSES.  
CASTINGS from 1 oz. to 12,000 lbs.

A

# WASHBURN & MOEN MANUFACTURING CO.,

WORKS IN WORCESTER, MASS., and WAUKEGAN, ILL.

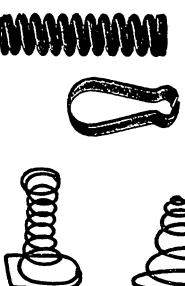
MAKERS OF IRON, STEEL AND COPPER

EVERY VARIETY OF **WIRE** FOR ALL PURPOSES.

FINE OIL TEMPERED SPRINGS A SPECIALTY.

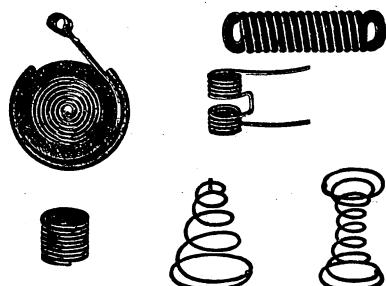
## SPIRAL

FURNITURE,  
BED AND  
SPECIAL  
SPRINGS.



## FLAT

CLOCK  
and  
WATCH  
SPRINGS.



EXPORT ORDERS PROMPTLY FILLED.

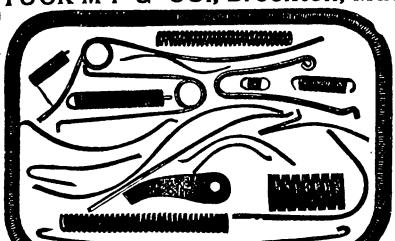
Warehouses: 16 Cliff and 241 Pearl Sts., New York; 107 & 109 Lake St., Chicago; 8 & 10 Pine St., San Francisco.



WM. MCFARLAND,  
IRON FOUNDER,  
TRENTON, - - N. J.  
Chilled Cast Wire DIES  
A SPECIALTY.  
Any Size or Style Made at Short Notice.

**J. F. KAY.**  
PASSEIC, N. J.  
MACHINERY FOR MAKING OF  
WIRE STRAND AND ROPE.  
Winding, Stranding and Closing Ma-  
chines, &c. Electric Wire and Cable  
Machinery. Hemp Rope and Cordage Machinery.  
Plans and Estimates.

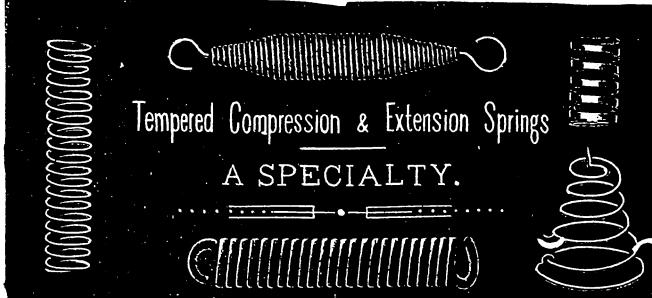
**SPRINGS—RIVETS.**  
Specialties in  
SHEET METAL WORK,  
CLOCK and INDICATOR POINTERS,  
CLARK & COWLES, Plainville, Ct.

TUCK M'F'G CO., Brockton, Mass.  
  
Send for Catalogue.  
Springs, Tools & Cutlery  
Tempered Springs of all kinds.



**MILLER & VAN WINKLE.**  
MANUFACTURERS OF  
**STEEL WIRE AND STEEL SPRINGS.**

### TEMPERED STEEL WIRE.



OFFICE AND WORKS: 18 to 24 Bridge Street, BROOKLYN, N. Y.



Guaranteed  
Best Anti-Friction Metal for all machinery bearings.  
For high speed and heavy crushing weight it has no equal. It is used on bearings where no other known metal will stand.  
Theo. Hertz & Son, Sole Mfrs.,  
30th St. and Park Ave., St. Louis, Mo.  
Mfrs Babbitt Metals, Solder, Lead Car Seals, etc.

### MACHINERY SPRINGS.



117th to 118th Street and Harlem River.

General Offices, Foot 118th Street, New York.



Makers of Iron, Bessemer, Siemens-Martin and Crucible Cast Steel Wire of all kinds, annealed, soft and hard drawn; Coppered Spring Wire for Furniture Springs, &c., Coppered Soft Wires, Baling Wires, Suspension Bridge and Rope Wires of all kinds, &c.

## STEEL MUSIC WIRES and MUSIC SPRING WIRES,

UNRIValed FOR PIANOFORTE STRINGS.

FOR THE HIGHEST CLASS OF SPRINGS.

Specialty of finest Cast Steel Wires, round, flat, square and any other shape, tempered and also in the soft state, guaranteed to harden and temper. Solid Rib and Paragon Umbrella Wires. Crinoline, Corset, Shade Roller, Lock, Hat, Brush, Saw, Band Saw, Clock Spring, Clock Bell, Clock Verge and Watch Spring, Rule and Tape Line and Eyeglass Wires, &c. Piano, Needle, Fish Hook, Drill and Hair Spring Wires. Special Cast Steel Wires of any kind made for special purposes. Also Covered Wires—Braided and Cloth and Paper Covered—for crinoline, corset and other purposes. Cold Rolled and Slit soft and Tempered Steel Strips of all kinds and for all purposes.

Special Wires and Springs of Every Description.

CORRESPONDENCE SOLICITED.

SAMPLES FURNISHED ON APPLICATION.

The largest coil of steel ever rolled of its dimensions,  $2\frac{1}{8}$  in. wide  $\times$  2250 FEET LONG  $\times$  .00425 in. thick.

## SUPERIOR STEEL COMPANY,

PITTSBURGH, PA.,

MANUFACTURERS OF ALL DESCRIPTIONS OF

## HOT and COLD ROLLED STRIP. STEEL.

In widths up to 10 inches and in thickness from .0025 to 2 inches and from ordinary hot rolled soft steel to the finest cold rolled watch mainspring steel. Fine crucible steel our specialty.

Coils Furnished up to 5000 feet long according to width and gauge ordered  
EASTERN REPRESENTATIVES:

Ely & Williams, 38 Park Row, New York; 1239 Market St., Philadelphia, Pa.

## Wire Cloth and Wire Goods

Hardware Grade and  
Fanning Mill Wire Cloth,  
Poultry Netting, Heavy  
Window Screen Wire  
Cloth, Coal and Sand  
Screens, Riddles, Ash  
Sieves, &c., &c.



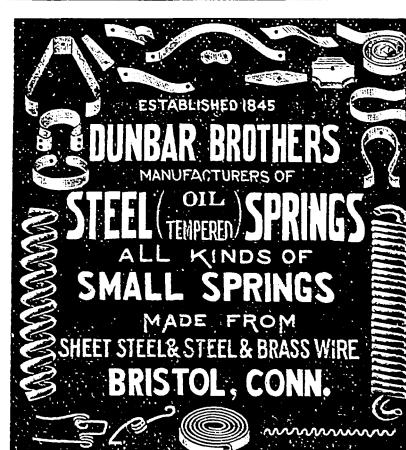
Office and Counter  
Railings, Elevator En-  
closures, Wire Stall  
Guards, Hay Racks  
Feed Boxes, Window  
Guards, &c., &c.

BUFFALO, N. Y.

VOLUTE,  
WIRE  
and  
FLAT STEEL

## SPRINGS

For Agricultural Implements, Machinery and various other purposes.  
Write for prices to  
SABIN MACHINE CO.,  
MANUFACTURERS,  
MONTPELIER, VT.



Coal Pits and Pitmen. By R. NELSON BOYD. A short History of the Coal Trade and the Legislation Affecting it. Illustrated, 12mo, cloth.....\$1.50  
For sale by DAVID WILLIAMS, 96-102 Reade St. N.Y.

Always  
Ask  
For



Unequaled for Strength  
and Durability.  
Made Only by  
Broderick & Bascom Rope Co.,  
St. Louis, Mo.

**HOWSON  
AND  
HOWSON**

Counsellors at Law  
Solicitors of Patents

**PHILADELPHIA**  
Forrest Building, 119 S. 4th St.  
**NEW YORK**  
Potter Building, 38 Park Row.  
**WASHINGTON**  
Atlantic Building, 928 F St.

**PATENTS**

U. S. and Foreign Secured.

Trade Marks and Copy Rights. Twenty Years' Experience. Send model or sketch and brief description of your invention for Free report as to patentability. Expert searches and opinions as to Scope, Validity and Infringement. Patent Causes Prosecuted and Defended. Practice in U. S. Supreme, Circuit and Circuit Appeals Courts, and U. S. Patent Office.

Send for "Plain Words about Patents," Free.

**PATENT PRACTICE EXCLUSIVELY.**

References Furnished on Application.  
**E. B. STOCKING, Attorney at Law,**  
611 F ST., N. W., WASHINGTON, D. C.

**PATENTS.**

H. W. T. JENNER, Patent Attorney and Mechanical Expert. 519 Seventh St., Washington, D. C. Charges moderate. Write for terms. Established 1883.

**CHARLES N. BUTLER, C.E.,  
ATTORNEY IN PATENT CASES,**

611 Mutual Life Building, PHILADELPHIA, PA.  
Tenth and Chestnut Sts.,

Formerly of the Examining Corps,  
U. S. Patent Office.

**W. S. ESTEY,**

No. 65 FULTON ST., NEW YORK,

MANUFACTURER OF

**WIRE CLOTH**

Of Brass, Copper, Iron, Galvanized and Steel Wire of all meshes and grades. For Mining, Milling and all other purposes. Locomotive Spark Wire Cloth, &c.,

— AND —

**WIRE WORK**

For Bank, Office and Counter Railing, Store Fronts, Window Guards, &c.

Galvanized Twist Netting.

Oliver's Patent Decoy Rat Traps.

S T Pat. Adjustable Foundry Riddles.

**S T Sand Screens.**

SEND FOR CATALOGUE.

**THE  
WIRE GOODS COMPANY**

Worcester, Mass.

Hardware and Kitchen Wire Goods. Specialties to order. Everything in Wire.

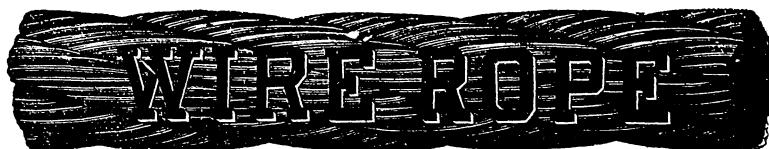
**Pocket Companion.** Containing useful information and tables appertaining to the use of wrought iron and steel as manufactured by Carnegie, Phipps & Co., Ltd., Pittsburgh, Pa. For engineers, architects and builders. 1892 edition. Edited by C. L. STROBEL, C.E., assisted by F. H. KINDL, C.E. Leather with flap, 334 pages. . . . . \$2.00

For Sale by David Williams, 96-102 Rende St., N. Y.

**A. LESCHEN & SONS' ROPE CO.,**  
MANUFACTURERS OF



**ST. LOUIS, MO.** CORRESPONDENCE INVITED.



**Williamsport Wire Rope Co., Williamsport, Pa.**



**WORKS:** **87 Liberty St., New York.** **Wilkesbarre, Pa.**

**NEW HAVEN WIRE MFG. CO.,**

Manufacturers of

**WIRE**

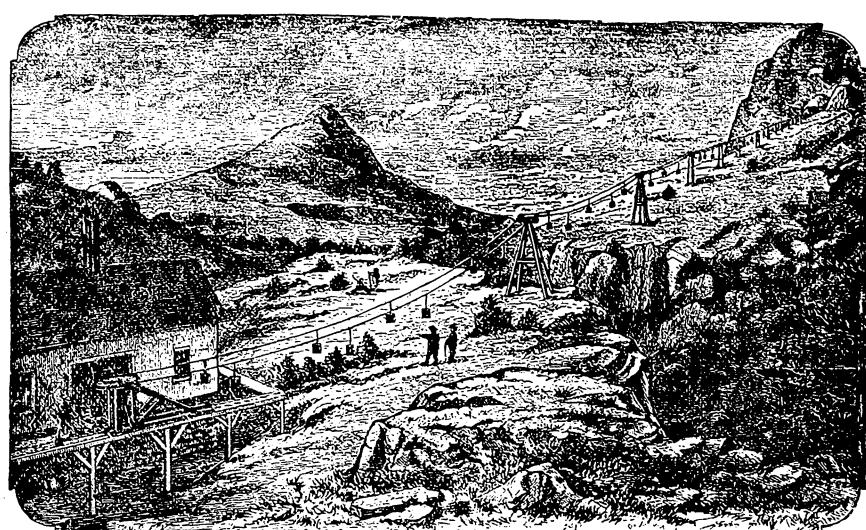
in great variety.

**NEW HAVEN, CONN.**

Represented in New York by HENRY B. NEWHALL CO., 105 Chambers St.

**CALIFORNIA WIRE WORKS,**

**509-511 Market St., San Francisco, Cal.**



MANUFACTURERS OF

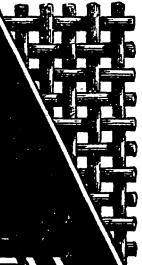
**WIRE ROPE FOR CABLE RAILWAYS AND MINING PURPOSES.**

**HALLIDIE'S PATENT WIRE ROPEWAY,**

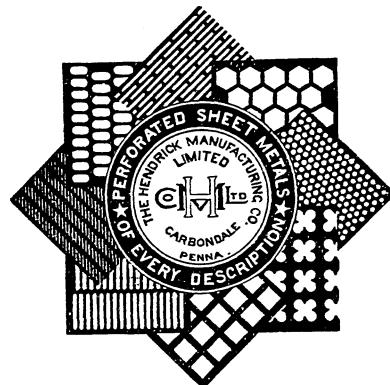
Simplest and most economical means of transportation. Send for Illustrated Catalogue.

**HOWARD & MORSE**  
45 FULTON ST.,  
NEW YORK.  
HEAVY MINING  
COPPER,  
BRASS,  
STEEL  
OR IRON  
WIRE CLOTH.

ALSO  
MANUFACTURERS OF  
GENERAL  
WIRE WORK.  
Window Guards,  
Stable Fixtures,  
RAILINGS,  
Sand Screens  
Coal Screens  
Etc.



**PERFORATED SHEET METALS  
OF EVERY DESCRIPTION.**



**THE HENDRICK MFG. CO., LTD.,  
CARBONDALE, PA.**

**WICKWIRE BROTHERS,** CORTLAND, N. Y.  
MANUFACTURERS OF

Wire Cloth and Wire Goods,



Coal Sieves,  
Flour Sieves,  
Corn Poppers,  
Dish Covers,  
Metallic  
Coal Sieves.

NEW PROCESS  
Cortland  
POWER LOOM  
WIRE CLOTH.

Every roll wrapped in Pink Paper  
and has our name on label.

**Kilmer Manufacturing Co.**

— Newburgh, N. Y.

Manufacturers of

**BALE TIES**

For Baling  
Hay, Straw,  
Rags,  
Excelsior, &c.

ALSO WIRE RODS, BARB WIRE, COILED STEEL WIRE, WIRE STAPLES, GALVANIZED WIRE, ORNAMENTAL FENCING, &c., &c.

Western Warehouse, 543 and 545 State Street, Chicago, Ill.

Western Office 21 Quincy Street, Chicago, Ill.

New York Office, 111 Water Street, New York City.

Works and General Office, Newburgh, N. Y.



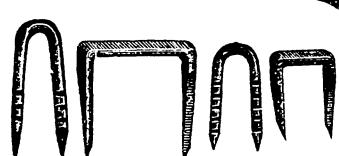
**THE VAN DORN IRON WORKS CO.,** Cleveland, Ohio.



Office and Salesroom, 157½ Euclid Ave.,  
MANUFACTURERS OF  
**WROUGHT IRON FENCE and RAILING.**  
Stable Fixtures, Crestings, Terminals, Wire Office and  
Counter Railing, Lawn Seats and Vases.  
Iron and Steel Jail Cell Work. Ornamental and Structural Ironwork.

**E. H. Titchener & Co.,  
BINGHAMTON, N. Y.**

— MANUFACTURERS OF —



**STAPLES in All Varieties,**

Double-Pointed Tacks, Bed Links, Etc.

New York City Agents, HARMON & DIXON,  
118 Chambers Street.

**Quick Shipment. Write for Prices.**

BARBED  
PLAIN  
CABLE **WIRE** NAILS  
STAPLES  
STRETCHERS

**INDIANA WIRE FENCE CO.,**

Crawfordsville, Ind.

**CHAMPION IRON  
COMPANY.**



The largest Iron Fence and Railing Works in the U. S.  
**KENTON, OHIO.**

**SPECIAL WIRE TACKS** Particular attention given to production of goods adapted to special lines of business. Duplicating samples a specialty.

**TACKS and NAILS.** **Taunton Wire Nail Co.,** Taunton, Mass.

# CLINTON WIRE CLOTH CO.,

Manufacturers of Every Description of

WIRE CLOTH, HEX. NETTINGS, WIRE LATH AND FENCING.

## Perforated Metals.

GALVANIZERS  
AND TINNERS OF

## Wire Cloth and Nettings.

Clinton "Standard" (Number 33 Wire) Painted Window Screen Wire Cloth.

FACTORY AND GENERAL OFFICE: CLINTON, MASS.

NEW YORK, 76 Beekman Street.

BOSTON, 199 Washington Street.

CHICAGO, 137 Lake Street.

# The Gilbert & Bennett Mfg. Co.

Pearl Window Screen Wire Cloth.  
Galvanized Steel Wire Cloth.  
Galvanized Wire Poultry Netting.  
"Cottage" Lawn & Garden Fencing.  
The World's Web Wire Fencing.  
Sieves, Riddles, Screens.  
Gilbert's Rival Ash Sifters.  
House Furnishing Wire Goods

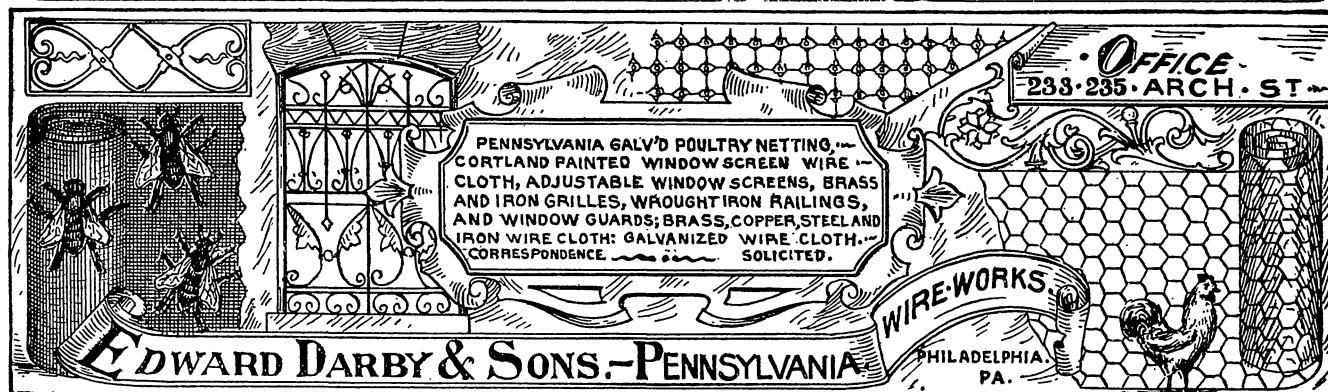
MANUFACTURE  
WIRE CLOTH, NETTING,  
Fencing, Gates, Fencing Tools,  
Wire Goods, Wire Work  
RAILINGS, WINDOW GUARDS.  
WIRE LATHING WITH HAMMOND'S METAL FURNING.

44 Cliff Street,  
**NEW YORK.**  
148 Lake Street,  
**CHICAGO.**  
Factories, { GEORGETOWN, CONN.  
CHICAGO, ILLINOIS.  
ESTABLISHED 1818.

# WRIGHT & COLTON WIRE CLOTH CO., Worcester, Mass.



NEW PROCESS  
HARD STEEL WIRE CLOTH AND NETTING  
GALVANIZED  
WIRE NETTING. Patented March, 1884.  
Painted Window Screen Wire Cloth,  
WIRE LATHING, HOUSE FURNISHING WIRE GOODS.  
SEND FOR LATEST CATALOGUE.



PAINTED AND GALVANIZED WINDOW SCREEN CLOTH.

IRON, STEEL, BRASS AND COPPER WIRE CLOTH.

MANUFACTURERS  
**THE ROEBLING  
STANDARD  
WIRE  
LATHING.**

TRENTON, 117 and 119 LIBERTY STREET,  
NEW JERSEY. NEW YORK.

171 and 173 LAKE STREET,  
CHICAGO.

25 and 27 FREMONT STREET,  
SAN FRANCISCO.

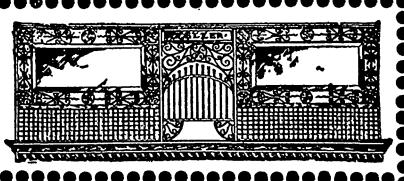
BORDEN & LOVELL,  
70 AND 71 WEST STREET,  
NEW YORK.

Steel, Iron and Wire Nails.

• NEW JERSEY •  
**WIRE CLOTH CO.**

**"JERSEY"**  
**POULTRY**  
**NETTING**  
**AND FARM**  
**FENCING.**

**H**IGHEST AWARD received at World's Fair on  
Bank and Office Railing, Wire and Iron  
Fencing, Flower Vases, Cheese Safes, Station  
House or Jail Cells.  
E. T. BARNUM, Detroit,  
Mich.  
Mention this paper.



Perforated Filter  
Press Plates.

# HARRINGTON & KING PERFORATING CO CHICAGO.

PERFORATORS OF STEEL, IRON, COPPER, ZINC, BRASS AND TIN.

GRAIN CLEANING AND MINING MACHINERY,  
WOOLEN, COTTON, PAPER AND PULP MILLS,  
RICE, FLOUR AND COTTON SEED OIL MILLS,  
SUGAR AND MALT HOUSES,  
DISTILLERIES, FILTER PRESSES,

FOR USE IN  
STONE, COAL AND ORE SCREENS,  
BRICK AND TILE WORKS, FILTERS,  
SPARK ARRESTERS, GAS AND WATER WORKS,  
OIL, GAS AND VAPOR STOVES,  
COFFEE MACHINERY, ETC., ETC.

STANDARD SIZES PERFORATED TIN AND BRASS ALWAYS IN STOCK.

Main Office and Works, 222 to 240 N. Union St., Chicago, Ill., U. S. A. Eastern Office, No. 284 Pearl St., New York.

BRONZE SCREEN PLATES  
To withstand action of  
ACIDULATED WATERS.

## HERCULES WIRE. PATENTED.



Absolutely the best general purpose Fence Wire on the market to-day. Write for prices.  
CLEVELAND FENCE CO., 21 Biddle St., INDIANAPOLIS, IND.

## ELECTRICAL BOOKS.

**Electric Lighting for Marine Engineers**; or How to Light a Ship by the Electric Light and How to Keep the Apparatus in Order. By SYDNEY F. WALKER. 298 pages, illustrated. 8vo, cloth... \$2.00

**The Dynamo, Its Theory, Design and Manufacture.** By C. C. and F. WALLIS HAWKINS. 190 illustrations. Thick 12mo, cloth. (The Specialists' Series)..... \$3.00

**Electrical Distribution.** By M. H. KILGOUR, H. SWAN and C. H. W. BIGGS. Its Theory and Practice. 174 illustrations 12mo, cloth..... \$1.00

**How to Use Electrical Measurement Apparatus.** By CHAS. P. FREY. A Manual of Practical Information Relating to Electrical Testing. Illustrated. 8vo, paper..... 50c.

**Portable Electricity: Being a Treatise on the Application, Methods of Construction and Management of Portable Secondary Batteries.** By J. T. NIBLETT. Fully illustrated. 8vo, cloth..... \$1.00

**Practical Dynamo Building.** By L. C. ATWOOD. With Detail Drawings and Instructions for Winding. Giving correct sizes of Wire, Dimensions of Iron, etc. etc., also Diagram for House Wiring. Illustration and Plates. 4to, cloth..... \$3.00

**The Electric Transmission of Intelligence.** By PROF. E. J. HOUSTRON. And other Advanced Primers of Electricity. 88 Illustrations. 12mo, cloth..... \$1.00

**The Dynamo, How Made and How Used.** By S. R. BOTTONE. Eighth edition, with additional matter and illustrations. 12mo, cloth..... \$1.00

**Dynamos, Alternators and Transformers.** By G. D. KAPP. Giving an exposition of the general principles underlying the construction of dynamo-electric apparatus without the use of high mathematics and complicated methods of investigation. 12mo, cloth..... \$4.00

**Electric Light Installations.** By Sir D. SALOMONS. In 3 vols. Vol I. The Management of Accumulators; a practical handbook. Seventh edition, revised and enlarged, 164 pages, 12mo, cloth. \$1.50

**Standard Tables for Electric Wiremen**, with Instructions for Wiremen and Linemen. Rules for Safe Wiring, Diagrams of Circuits and Useful Formulas and Data. By CHARLES M. DAVIS. Third edition, thoroughly revised and edited by W. D. Weaver. Illustrated, 18mo, mor..... \$1.00

**Practical Electric Light Fitting.** By F. C. ALLSOUP. A treatise on the wiring and fitting-up of buildings deriving current from central station mains and the laying down of private installations. 290 pages, 12mo, cloth..... \$1.50

**Electrical Tables and Memoranda.** By SYLVANUS P. THOMPSON and E. THOMAS. 128 pages, 2 x 2 1/4 inches, roan..... \$0.50

**Johnston's Electrical and Street Railway Directory.** Fourth Year of Publication, 8vo, cloth..... \$5.00

**Measurements of Electric Currents.** Electrical Measuring Instruments, by JAMES SWINBURNE. Meters for Electrical Energy. By C. H. WORDINGHAM. Edited by T. COMMERFORD MARTIN. Illustrated, 1 folding plate..... \$0.50

**Alternating Currents of Electricity.** By GILBERT KAPP. Their Generation, Measurement, Distribution and Application. Authorized American edition. With an introduction by WILLIAM STANLEY, JR. (Reprinted from Professional Papers of the Corps of Royal Engineers). Illustrated, 12mo, cloth..... \$1.00

**The Electric Railway in Theory and Practice.** By O. T. CROSBY and DR. LOUIS BELL. Second edition, revised and enlarged, 183 illustrations. 8vo, cloth..... \$2.50

**The Measurement of Electrical Currents and Other Advanced Primers of Electricity.** By E. J. HOUSTRON. 429 pages, 169 illustrations..... \$1.50

**The Science and Practice of Lighting**, as applied to sheets, open spaces and interiors. By W. H. Y. WEBER. An elementary study. A series of articles contributed to the *Journal of Gas Lighting*, etc. 8vo, cloth..... \$1.40

**Experimental Electricity.** By E. T. TREVERT. Numerous illustrations. New revised and enlarged edition. 12mo, cloth..... \$1.00

Sent, post-paid, on receipt of price, by

DAVID WILLIAMS, PUBLISHER & BOOKSELLER

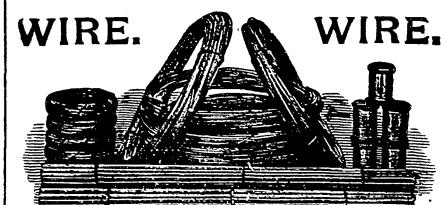
96-102 READE ST., NEW YORK.



FRANKLIN S. MILES,  
Manufacturer of  
Brass, Iron, Steel and German Silver  
SCREWS,  
205 Quarry St., Philadelphia.

GEO. W. PRENTISS & CO.,  
HOLYOKE, MASS.

—MANUFACTURERS OF—



Bright, Coppered, Annealed and Tin Plated.  
FINISHED to order, round, square, oval or flat.

TINNED WIRE OF ALL SIZES A SPECIALTY

COBB & DREW,  
PLYMOUTH, MASS.

Manufacturers of Norway Iron Rivets, Brass and Copper Rivets, Burrs, Washers, D. P. Tacks and Staples.

New York Agency, James S. Henderson, successor to Disosway & Henderson, Hardware.

Agents for Philadelphia Star Carriage and Tire Bolts.

**ATLAS TACK CORPORATION.**

508 SEARS BUILDING, BOSTON, MASS., U. S. A.

DUNBAR, HOBART &amp; CO., WHITMAN, MASS.

ESTABLISHED IN 1810.

CONSOLIDATED

1891.

LORING &amp; PARKS, PLYMOUTH, MASS.

ESTABLISHED IN 1842.

TAUNTON TACK CO., TAUNTON, MASS.

ESTABLISHED IN 1854.

A. FIELD &amp; SONS, TAUNTON, MASS.

ESTABLISHED IN 1827.

AMERICAN TACK CO., FAIRHAVEN, MASS.

ESTABLISHED IN 1867.

OLD COLONY RIVET CO., PLYMOUTH, MASS.

ESTABLISHED IN 1868.

Tacks, Brads, Small Nails, Shoe Nails, Lining and Saddle Nails, Tufting Nails and Buttons, Wire Nails, Finishing Nails, Patent Brads, Hungarian Nails, Steel Shanks for Boots and Shoes, Wire Tacks, Escutcheon Pins, Eyelets, Glaziers' Points, Rivets, Burrs, Furniture Springs, Pilgrim Spring Bed, and other articles.

We have the largest and only complete and fully assorted stock in the world. Our manufacturing facilities are unequalled. The foregoing well known brands we continue to use, and either will be furnished upon request. We have long distance telephone connection with our New York Store and our factories.

**MAIN OFFICE, 508 SEARS BUILDING, 199 WASHINGTON ST., BOSTON, MASS.**

**BRANCH OFFICE & WAREHOUSE, 31 WARREN ST., NEW YORK.**

**BRANCH OFFICE & WAREHOUSE, 239 & 241 LAKE ST., CHICAGO, ILL.**

**BRANCH OFFICE & WAREHOUSE, 408 MARKET ST., SAN FRANCISCO, CAL.**

**BRANCH OFFICE & WAREHOUSE, 406 COMMERCE ST., PHILADELPHIA, PA.**

**BRANCH OFFICE & WAREHOUSE, 14 WEST GERMAN ST., BALTIMORE, MD.**

Tacks, Wire Nails and Brads, Hoop Nails, Staples, Silver and Japanned Lining and Saddle Nails, Double Pointed Tacks, Slating and Roofing Nails.

**BONNIE BLUE TACKS.**  
100 Kegs in a Box, Assorted 3 to 12 oz. Retails 2 Kegs for 5 cents.

**PARISIAN GILT NAILS.**  
20 papers in Carton. 5 cent seller.

**MONARCH WOOD KEG CARPET TACKS.**  
5 cent seller.

**BILL NYE BRAD BOX.**  
168 Papers Wire Brads, assorted  $\frac{1}{2}$  to 2 in. Each Paper just right to retail for 5 cents.

QUARTER SIZE CUT OF

**HAMMER TRADE CARPET TACKS MARK.**



MADE ONLY BY

**GRAND CROSSING JACK CO.** GRAND CROSSING, CHICAGO, ILL. U.S.A.

GRAND CROSSING JACK CO. GRAND CROSSING, CHICAGO, ILL. U.S.A.

# The New York Iron Roofing and Corrugating Co.

Fine and Largest Variety of FIRST & WASHINGTON STS. JERSEY CITY, N.J.  
Sheet Metals. Products manufactured in the U.S.

## THE "Paragon"

Increases in sales  
Every year. **Why?** Because they are

ENDORSED

by every  
purchaser.

WRITE

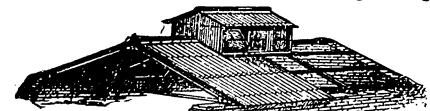
THE

Bromwell

Brush & Wire  
Goods Co.,

Cincinnati, - - - Ohio.

Corrugated, Crimped and Clap-Board Iron Roofing & Siding.



Iron Buildings, Roofs, Doors, Shutters, Cornices, Skylights, Bridges, &c.

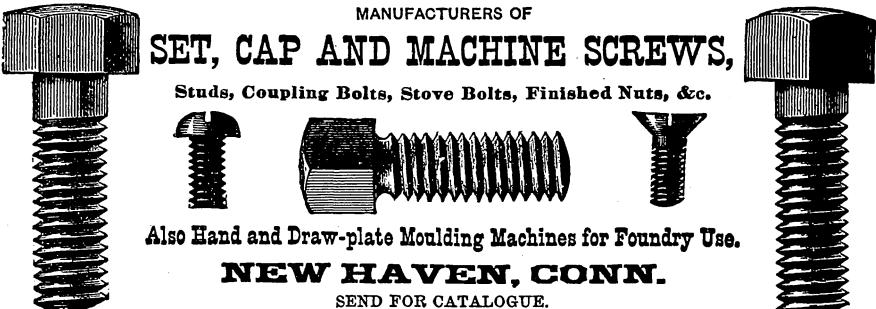
**MOSELEY IRON BRIDGE AND ROOF CO.**  
Office 5 Dey Street, Room 13, NEW YORK.

## REYNOLDS & CO.

MANUFACTURERS OF

### SET, CAP AND MACHINE SCREWS,

Studs, Coupling Bolts, Stove Bolts, Finished Nuts, &c.



Also Hand and Draw-plate Moulding Machines for Foundry Use.

**NEW HAVEN, CONN.**

SEND FOR CATALOGUE.

## We Manufacture Machine Screws.

Electric and Chandelier trade a specialty.

### NEW ENGLAND SCREW CO.

14 Mt. Washington Ave.  
BOSTON, MASS.

CRIMPED  
STEEL  
WIRE

## LAWN FENCES

TREE GUARDS and SETTEES. CHEAPER THAN WOOD.

McCALLIP FENCE AND WIRE WORKS, Columbus, Ohio.



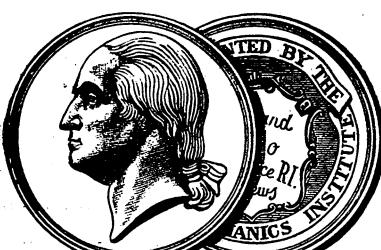
U. S. CENTENNIAL EXHIBITION  
1876



AMERICAN INSTITUTE  
1841



HARTFORD CO. AGRICULTURAL SOCIETY  
1842



METROPOLITAN MECHANICS INSTITUTE

ESTABLISHED 1838.  
**American Screw Company,**  
Providence, Rhode Island,  
Has Received an Award at the  
**World's Columbian  
Exposition**



UTICA MECHANICS ASSOCIATION  
1856



AMERICAN INSTITUTE  
1891



MASS. CHARITABLE MECHANIC ASS'N  
1844



FRANKLIN INSTITUTE  
1856



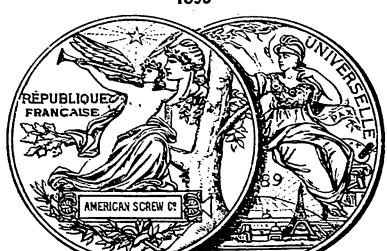
TABLE MECHANIC ASSOCIATION  
1890.



AMERICAN INSTITUTE  
1847



AMERICAN INSTITUTE  
1855



EXPOSITION UNIVERSELLE  
PARIS, 1889



WORCESTER CO. MECHANICS ASS'N  
1849



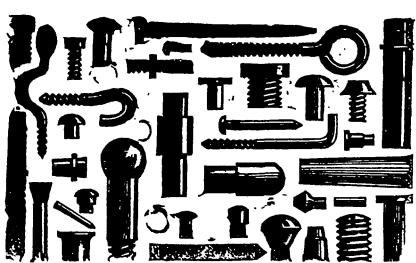
WORLD'S FAIR, N.Y.  
1853



MIDDLESEX MECHANIC ASSOCIATION  
1851



MASS. CHARITABLE MECHANIC ASS'N  
1850



# IRON AND BRASS RIVETS, STUDS, PINS, SCREWS, &c.,

For Manufacturers of Light Hardware.

BLAKE & JOHNSON, WATERBURY, CONN.

## NEW CASTLE WIRE NAIL CO.,

MANUFACTURERS OF

STEEL WIRE NAILS.

WIRE RODS AND WIRE.

Office and Works,

NEW CASTLE, PA.

### THE BOND NAIL.



These nails are made from different sizes of wire with head at any desired position between the points. For coopers, box and furniture manufacturers' dowels they are unsurpassed. Builders and repairers of all kinds will find these nails useful. We also manufacture Doweling Machines and Sets for driving these nails. Address

THE BOND NAIL CO.,  
P. O. Box 23, RAYNHAM, MASS.

PHILLIPS, TOWNSEND & CO.  
North Penn Junction, Philadelphia.

WIRE NAILS, - - -  
NORWAY RIVETS.

Rivets marked "P" are not of our make. We make only first-class NORWAY IRON RIVETS

### VADE MECUM.

A work of reference for the use of Architects, Architectural Iron Workers, Builders, Blacksmiths, Book keepers, Boiler Makers, Contractors, Civil, Mechanical, Hydraulic, Mining, Stationary, Marine and Locomotive Engineers, Foremen of Machine Shops, Firemen, Master Mechanics of Railroads, Master Car Builders, Machine Shop Proprietors, Machinery Jobbers, Machinery Salesmen, Machinists, Pattern Makers, Railway Superintendents, Railway Supply Agents, Road-masters, Superintendents of Factories and Business Men generally.

Compiled and Arranged by

D. B. DIXON,

And with a most exhaustive Electrical Department by  
THOS. G. CRIER,  
A Prominent Specialist.

480 Pages, 8 1/4 x 5 3/4 inches, Cloth, \$2.50.

Sent, post-paid, on receipt of price by

DAVID WILLIAMS, Publisher & Bookseller.

46-102 Reade Street, New York



### THE SALEM WIRE NAIL CO.

MANUFACTURERS

## WIRE NAILS,

Works: SALEM, O.; FINDLAY, O.

General Office: - SALEM, OHIO.

BRANCH OFFICES:

Room 28, 277 Broadway, New York.

415 Phenix Bldg., Chicago.

200 Amer. Central Bldg., St. Louis.

19-20 Ainsworth Block, Portland, Ore.

38 Pickering Bldg., Cincinnati, O.

## CLENDENIN BROTHERS,

SHEET COPPER WIRE.  
ROD NAILS AND  
INCOT TACKS.  
RIVETS AND  
BURS.

## SEAMLESS BRASS AND COPPER TUBES.

### Soldering Coppers

III South Gay St., - - Baltimore, Md.

# 2 STAVE NAIL KEG

Stock

Manufactured by  
CRESCENT MFG. CO.  
DETROIT, MICH.

# Gautier Steel Department of Cambria Iron Co.,

JOHNSTOWN, PA.

—: MANUFACTURERS OF:—

## MERCHANT BAR STEEL:

Including Tire, Toe Calk, Machinery, Carriage Spring, Railroad Spring, Hoe, Rake, Fork, etc.

## AGRICULTURAL STEEL AND SHAPES:

Finger Bars, Knife Backs, Rake Teeth, Bundle Carrier Teeth, Tedder Forks and Springs, Spring Harrow Teeth, Harrow (Drag) Teeth, Seat Springs, etc.

## PLOW STEEL:

Flat and Finished Plow Shapes, Digger Blades, Slabs, (Penn and Pernot), Hammered Lay, Rolled Lay, etc.

## COLD ROLLED STEEL SHAFTING.

## STEEL HARROW DISCS.

## CAMBRIA LINK BARB WIRE.

New York Office,  
102 Chambers St.

Philadelphia Office,  
S. W. Cor. 5th & Commerce Sts.

Chicago Office,  
209 Phenix Building.

Southern Office,  
Chattanooga, Tenn.

# Do You Handle Iron or Steel Roofing?

We manufacture every variety, including "Corrugated," "V Crimp," "Standing Seam," etc., etc.

We want enterprising agents, of good standing, in each county, and solicit correspondence.

Our Little Book, "The Life of an Iron Roof, or how long will it last," sent free.

**The Cincinnati Corrugating Co.,**  
BOX 312, PIQUA, OHIO.

• STEEL ROOFING •  
• CORRUGATED IRON EAVE TROUGH •  
• CONDUCTOR PIPE • ROOF PAINTS • ETC.  
CORRESPONDENCE  
SOLICITED THE CAMBRIDGE ROOFING CO. CAMBRIDGE,  
OHIO.

THE KANNEBERG ROOFING CO. CANTON, O.  
MFR'S OF ORIGINATORS OF GENUINE STEEL ROOFING.  
THE KANNEBERG PAT. LATEST IMPROVED FOLDED LOCK SEAM STEEL ROOFING.  
CORRUGATED & CRIMPED IRON ROOFING SIDING & CEILING EAVE-TROUGH.  
CONDUCTOR PIPE &c.  
WRITE FOR CATALOGUE & PRICE LIST

THE CELEBRATED  
**"SILVER FINISH"**  
GALVANIZED POULTRY NETTINGS.  
FOR SALE BY THE HARDWARE TRADE.

GET THE BEST

## ALSITE SOLDER

FOR

## ALUMINUM.

Does not disintegrate. The butt joint can be rolled, hammered or drawn. Full particulars on application.

ALSITE ALUMINUM CO.,  
106 Liberty St., New York

## Standard Books On

## METALLURGY.

### A Treatise on the Metallurgy of Iron.

Containing outlines of the history of iron manufacture, methods of assay and analyses of iron ores, processes of manufacture of iron and steel, &c. By H. Bauerman, F. G. S., associate of the Royal School of Mines. Fifth edition, revised and enlarged. Illustrated with numerous wood engravings from drawings by J. B. JORDAN. 515 pages: cloth. .... \$2

### The Metallurgy of Steel.

Volume I. By HENRY M. HOWE, A.M., S.B., mining and metallurgical engineer; illustrated with many engravings and plates. 383 pages; 11 x 14 inches. .... \$10

### Handbook for Charcoal Burners.

Translated from the Swedish of G. Svedelius by PROF. R. B. ANDERSON, and edited with notes by PROF. W. J. L. NICODEMUS, C.E.: 23 wood engravings; 217 pages; cloth. .... \$1.50

### The Metallic Alloys.

A practical guide for the manufacture of all kinds of alloys, amalgams and solders, used by metal workers; together with their chemical and physical properties and their application in the arts and the industries; with an appendix on the coloring of alloys. Translated and edited chiefly from the German of A. KRUPP and ANDREAS WILDBERGER, with extensive additions by WM. T. BRANNT; illustrated by 16 engravings; 428 pages; cloth. .... \$3.00

### The Metal Worker's Handy Book of Receipts and Processes.

Being a collection of chemical formulas and practical manipulations for the working of all the metals and alloys, including the decoration and beautifying of the articles manufactured therefrom, as well as their preservation. Edited from various sources by WILLIAM T. BRANNT. 530 pages; cloth. .... \$2.50

### Steel and Iron.

Comprising the practice and theory of the several methods pursued in their manufacture, and of their treatment in the rolling mills, the forge and the foundry. By WILLIAM HENRY GREENWOOD, F.C.S. With 97 diagrams; 536 pages; cloth. .... \$2

### An Introduction to the Study of Metallurgy.

By W. C. ROBERTS-AUSTEN, C. B., F. R. S., Associate of the Royal School of Mines. Chemist and Assayer of the Royal Mint. Professor of Metallurgy in the Royal College of Science, with which the Royal School of Mines is incorporated. CONTENTS: Physical properties of metals; alloys; the thermal treatment of metals; fuel; materials and products of metallurgical processes; furnaces; means of supplying air to furnaces; typical metallurgical processes; economic considerations. With numerous diagrams, 292 pages, cloth. .... \$2.50

*Sent, postpaid, on receipt of price, by*

**DAVID WILLIAMS,**

Publisher and Bookseller.

96-102 Reade St. New York.

**Lukens Iron AND Steel Co.** INCORPORATED 1890.

The First to make Boiler Plates in America.

Chas. Huston, Pres. A. F. Huston, Vice-Pres. C. L. Huston, Genl. Mgr. Robt. B. Haines, Jr., Secy. Jas. Humpton, Treas.

**STEEL AND IRON PLATES, ALSO SHEETS**

TO EXTREME DIMENSIONS. WIDTHS UP TO 10 FEET. THICKNESS, No. 12 GAUGE TO 1½ INCHES.

—ESTABLISHED 1810.— NEW YORK OFFICE: NO. 29 Broadway. PHILADELPHIA OFFICE: 62 & 64 Bullitt Bldgs.

WORKS: Coatesville, Pa.

FRANK SAMUEL,  
136-138 So. 4th St.,  
Philadelphia.

# LOW PHOSPHORUS

**PIG IRON**—.08 or under.  
**SCRAP**—.08 or .06 or under.  
**ORE**—For O. H. and Furnace Use.  
**MELTING BAR**—  
Open Hearth and Bessemer Billets, Skelp, Muck Bars and Scrap, Foundry and Bessemer Pig Iron. Syracuse Tube Co.'s Tubes and Pipe.

**THE PHÆNIX IRON CO., 410 Walnut St., Philadelphia,**

MANUFACTURE ALL THEIR PRODUCTS BOTH IN

### WROUGHT IRON AND OPEN HEARTH STEEL.

Beams. Channels, Deck Beams, Angles, Tee-bars, Zee-bars and other shapes, Round, Flat and Square BARS of all sizes, Especially adapted for Bridge and Ship Builders, Fire-proof Buildings, Shafting and all Structural Purposes.

**SPECIALTIES**, in Wrought Iron or Steel:—Phoenix Columns and Upset Eye-Bars of all sizes, Roof Trusses, Girders, Joists and Built-up Shapes of every description.

AGENTS:—EDWARD CORNING & Co., 29 Broadway, NEW YORK; EDWARD CORNING & Co., 70 Kilby St., BOSTON, MASS.; JAMES B. STOKES, 182 Market St., SAN FRANCISCO. WESTERN OFFICE: A. C. STITES, 981 The Rookery, CHICAGO.

**POTTSVILLE IRON AND STEEL CO., POTTSVILLE, PA.,**

PHILADELPHIA OFFICE, 226 SOUTH 4th STREET

MANUFACTURERS OF ALL KINDS OF

### STRUCTURAL IRON AND STEEL,

Viz., I Beams, Deck Beams, Channels, Tees, Angles, Plates and Bars; and also Open Hearth Steel Billets, Blooms and Slabs.

**BREWERY, MALT AND ICE HOUSE CONSTRUCTION A SPECIALTY.**

Designers and Constructors of Roofs, Trusses, Columns, &c.

### TESTED CHAINS.

**BRADLEE & CO., - EMPIRE CHAIN WORKS,**

Beach and Otis Streets, PHILADELPHIA.

*Chains for Foundry Cranes and Slings, "D. B. G." Special Crane Chain. Steel and Iron Dredging, Slope and Mining Chains. Ship's Cables and Marine Railway Chains.*

**BARCLAY W. COTTON & CO.,**  
Successors to ESHERICK, COTTON & CO.

S. T. WELLMAN, President. J. H. ROOP, Treasurer. C. H. WELLMAN, Superintendent  
S. H. CHAUVENET, Vice-President. RICHARD PETERS, Jr., Secretary.

Iron and Steel Merchants.

AGENTS FOR

**AMERICAN WIRE GLASS MFG. CO.**  
418 Walnut St., PHILA.

**WELLMAN IRON AND STEEL CO.**

MANUFACTURERS OF

Highest Grade Open Hearth Low Phosphorus Steel Fire Box and Boiler Plate. Bessemer Steel Ship and Tank Plate. Open Hearth and Bessemer Blooms and Slabs. Low Phosphorus Pig Iron.

PLATES UP TO 126 INCHES IN WIDTH.

General Office and Works, Thurlow, Delaware County, Pa.

MFLLIN WHEELER. G. W. NICOLLS.  
Nicolls, Wheeler & Co.,  
FORMERLY  
SITES, WHEELER & CO.,  
216 South Third St., Philadelphia, Pa.  
—DEALERS IN—  
**IRON AND STEEL SCRAP.**  
Pig Iron, Muck Bars, Charcoal Blooms, &c., &c.,  
Steel and Iron Plates, New and Old Rails.

Chicago, Ills., No. 656 "The Rookery." New York, N. Y., No. 7 Nassau Street,  
E. W. CRAMER, Agent. J. H. BELCHER, Agent.

BARS, BANDS, HOOPS,  
BOLTS, NUTS, RIVETS,  
ROOF TRUSSES.

70 KILBY ST.,  
**BOSTON.**

**EDWARD CORNING & CO.,**  
MANUFACTURERS' AGENTS AND COMMISSION MERCHANTS.  
BEAMS, CHANNELS,  
ANGLES, TEES, PLATES,  
RIVETED GIRDERS.  
29 BROADWAY,  
**NEW YORK.**

**IRON AND STEEL,**  
421 CHESTNUT ST.,  
**PHILADELPHIA.**

OUR OFFICES AND MILLS ARE CONNECTED BY TELEPHONES.

W. S. PILLING.

T. I. CRANE

**PILLING AND CRANE.**

**IRON ORES:** Lake Superior, Foreign, Concentrates, Magnetic and native Self-fluxing.  
**PIG IRON:** Low Phosphorus, Open-hearth, Bessemer and other grades.  
**STEEL:** In Blooms, Slabs and Billets, and scrap.  
**COKE:** For Furnace and Foundry use.  
 BULLITT BUILDING, 141 S. FOURTH ST., PHILADELPHIA.

**EDWARD J. ETTING,**  
**IRON BROKER & COMMISSION MERCHANT**  
 222 S. THIRD ST., PHILADELPHIA, PA.  
 Pig, Bar and Railroad Iron, Old Rails, Scrap.  
 AGENT FOR THE  
**MOUNT SAVAGE FIRE BRICK,**  
 Eastern Penna., West New Jersey and Delaware.  
**AGENT TRENTON IRON CO.,**  
 For the Sale of Wire and Wire Rope.  
 Longdale (Va.) and other Pig Irons.  
 STORAGE YARD, Pier No. 57 South (old Navy Yard),  
 which is connected with Penn. R. R. and its various  
 connections. Negotiable Warehouse Receipts issued.  
 CASH ADVANCES MADE ON IRON.

**ALAN WOOD COMPANY,**  
 MANUFACTURERS OF  
 Patent Planished, Galvanized, Common, Best Refined, Cleaned and Charcoal Bloom,  
**PLATE & SHEET IRON.**  
 ALSO LIGHT PLATES AND SHEETS OF STEEL.  
 No. 519 Arch Street, Philadelphia, Pa.  
 Orders solicited especially for Corrugated, Gasholder, Pan and Elbow, Water Pipe, Smoke Stack.  
 Tank and Boat Iron: Last, Stamping, Ferrule, Locomotive Headlight and Jacket Iron.

ESTABLISHED 1869.  
**JEROME KEELEY & CO.,**  
 The Philadelphia Bank Bldg., 421 Chestnut St.,  
 PHILADELPHIA.  
**Foundry & Forge Pig Irons,**  
**Iron Ores, Coke, Coal,**  
 Steel Blooms, Billets, Rails, etc.  
**Muck Bars, Blooms, Scrap Iron.**  
 Consulting Engineers in Metallurgy and Mining.

**CUMBERLAND NAIL AND IRON CO.,**  
 MANUFACTURERS OF  
**"Cumberland" Nails & Wrought Iron Pipe,**  
 43 North Water St., and 44 North Delaware Ave., PHILADELPHIA.

**JUSTICE COX, JR.,**  
 218 South 4th St., Phila., Pa.  
**IRON and STEEL.**  
 — AGENT FOR —  
 Haldeman, Grubb & Co.'s.  
 Chickies Bessemer Pig Iron.  
 Mahoning Rolling Mill Co.'s.  
 Best Quality Skelp Iron and Steel.  
 Pulaski Iron Co.'s.  
 High Grade Foundry and Forge Pig Iron.  
 Hainsworth Steel Co.'s.  
 Standard Bessemer Steel Billets.  
 Bars, Angles, Sheets, Tank and Bridge  
 Plates, Muck Bars, Blooms, Scrap Iron  
 and Tool Steel.

**J. J. MOHR,**  
 Bullitt Building, No. 131 South Fourth St., Philadelphia, Pa.  
 — SOLE AGENT FOR —  
 Sheridan, Temple, Brooke, Leesport, Mill Creek, Keystone, Mt. Laurel, Logan and Oley FOUNDRY, FORGE, CHARCOAL AND BESSEMER PIG IRON.  
 Dealer in Scrap, Old Car Wheels, Muck Bars and Connellsville Coke.

**J. W. HOFFMAN & CO.,**  
 Bullitt Building, 135 So. 4th St., Philad'a.,  
 Iron and Steel Merchants.  
**PIG IRON,**  
 Iron and Steel Plates, Sheets, Bars and Shapes. Rails,  
 Cars and Locomotives. Track Equipment.  
 CORRESPONDENCE SOLICITED.

**JAMES G. LINDSAY & CO.**  
 BULLITT BUILDING, 133 South Fourth St., PHILA.  
**IRON and STEEL STRUCTURAL MATERIAL**  
 For all purposes. Estimates furnished for Iron and Steel Structures.

**JOHN L. HOGAN & CO.,**  
 IRON COMMISSION MERCHANTS.  
 Bullitt Building, 135 South Fourth St., Phila.  
 Agents for Brier Hill, Lehigh, Struthers  
 AND MUIRKIRK PIG IRON,  
 Delaware Rolling Mill, muck bars. Youngstown Steel  
 Co., Connellsville Coke.

**High Grade Tested Chains.**  
**JAMES MCKAY & CO.,**  
 29TH & LIBERTY STREETS, PITTSBURGH, PA.  
 Manufacturers of Coil, Crane and Stud Chain. We also manufacture High Grade  
 Steel Chain made of Basic Steel and Special Crane Chain made of U. S. Iron.

**W. H. THOMSON & CO.,**  
 Dealers in  
**IRON and STEEL and**  
**other METALS**  
 FOR ALL PURPOSES,  
 Room 259, Bullitt Building,  
 PHILADELPHIA, PA.

**FITZSIMONS & CO.,**  
 MANUFACTURERS  
**COLD DRAWN** **SHAFTING** **IRON STEEL**  
 CLEVELAND, OHIO.

E. Houston. J. Max Bernard. H. H. Houston.  
**C. B. HOUSTON & CO.,**  
 Bullitt Building. PHILADELPHIA.  
 Pig Iron, Coal, Coke, Steel Rails, Structural  
 Iron, Steel Castings and Fire Brick.  
 Sole Agents for PAXTON ROLLING MILLS.  
**STEEL AND IRON PLATES**

**WEST'S MOULDERS' TEXT BOOK**  
 BEING PART II. OF AMERICAN FOUNDRY PRACTICE,

Giving the best methods and rules for obtaining good castings, with detailed  
 description for making moulds. A thoroughly practical book  
 that should be in the hands of every moulder.

PRICE, - Cloth, - 460 Pages, - - \$2.50.

SENT, POST-PAID, ON RECEIPT OF PRICE BY

DAVID WILLIAMS, Publisher and Bookseller,

96-102 Reade Street,

New York City.

**FRANCIS WISTER**  
 COMMISSION MERCHANT,  
**Coke, Coal, Ores.**  
 PEA AND BUCKWHEAT (Red and White Ash).  
 National Foundry Coke a Specialty. Sulphur less  
 than 0.5.  
 All Sizes National Crushed Coke.  
 420 Walnut Street, PHILADELPHIA.

# FRANCIS HOBSON, SEAMAN & CO.,

Successors to FRANCIS HOBSON & SON,  
DON STEEL WORKS, SHEFFIELD.

Sole Manufacturers of

**HOBSON'S "CHOICE" XX Extra Best and "Warranted Best"**  
**Cast Steels for Tools, etc.**

HOBSON'S "CHOICE" Extra Quality Needle Wire.

**SEAMAN'S "NELSON" Brand Extra Cast Steel for Turning Hardest Chilled Rolls, &c.**  
WAREHOUSE, 97 John St., New York. CHAS. HUGILL, Agent.

## THOS. FIRTH & SONS, LIMITED, SHEFFIELD. CRUCIBLE CAST STEEL.

ABBOTT, WHEELOCK & CO. Agents and Importers of  
**SWEDISH IRON,**

85 OLIVER ST., BOSTON.

28 CLIFF ST., NEW YORK.

## S. & C. WARDLOW, SHEFFIELD, ENGLAND.

Manufacturers of the Celebrated Cast and Double Shear Steel,

In Bars, Sheets and Coils, for fine Pen and Pocket Cutlery, Razors, Carvers, Butchers' Knives, Files, Band Saws, Clock, Watch and all other Springs; also Sole Makers of the Special Brand "**TOUGH**" Cast Steel for Leather Splitting and Machine Knives of every description, and for Turning and all other Tools, Dies and Punches.

Office and Warehouse, 95 John St., New York. Frank S. Pilditch, Agent.

GUSTAF LUNDBERG,

Agent for N. M. HOGLUND'S SONS & CO. of Stockholm.

## Swedish and Norway Iron.

Bessemer and Open Hearth Steel.

19 KILBY STREET, BOSTON.

CARLISLE KAYSER, ELLISON & CO., SHEFFIELD.  
WORKS, ENGLAND

Late WILSON HAWKSWORTH, ELLISON & CO.,

(ESTABLISHED 1825.)

## CRUCIBLE STEEL AND STEEL WIRE.

WETHERELL BROS., Agents.

31 OLIVER STREET, BOSTON.

93 LIBERTY STREET, NEW YORK.

## JONAS & COLVER CONTINENTAL STEEL WORKS, SHEFFIELD, ENGLAND.

MANUFACTURERS OF ALL KINDS OF STEEL.

Tool Steel, Drill Rods, Needle Wire, Hot Rolled Sheet Steel, Cold Rolled Steel for Cores, Set Springs, Band Saws, Clock and Watch Springs and Parts, and all other Purposes.

HERMANN BOKER & CO., 101 & 103 Duane Street,

(Formerly CARL F. BOKER),

Sole Agents and Importers of Steel and Crucible Wire Rods, &c.

## JESSOP'S STEEL

MANUFACTURED BY

WM. JESSOP & SONS, L'D.

OF Best Quality,  
IN Bars, Sheets AND Plates

Large assortment of sizes in stock at

91 John St., - - - - -

And other Agencies.

NEW YORK,

SHEFFIELD,  
ENGLAND.

Gold Medal Paris,  
1869.

## "F. W. MOSS" SHEFFIELD STEEL & FILES

For further particulars apply  
to

NEWTON &

SHIPMAN.

83 John St., New York.

Prices for Direct Importation in Wholesale Quantities From Sheffield.		Per ton in Sheffield.
Improved Mild Centered Cast Steel for Taps, Reamers, &c	.....	..... @ £59
Warranted Extra Cast Steel for Taps, Dies, Milling Tools, &c.	.....	..... " 50 "
Warranted Cast Steel for tools, Taps, Dies, Turning Tools, &c.	.....	..... " 44. 10/ "
Best Crucible Machinery Steel	.....	..... " 30 "
Best C. S. EXTRA WEIGHT HAND CUT FILES	.....	..... @ 50% & 4% cash discount "

No charge for extra sizes when steel is ordered in wholesale quantities of assorted sizes.

# CAMBRIA STEEL,

Steel Rails, STANDARD AND LIGHT WEIGHTS, Street Rails and Railway Fastenings,  
BESSEMER AND OPEN-HEARTH BLOOMS, BILLETS AND BARS.  
Steel Axles, Steel Angles, Steel Channels, Steel Forgings.  
CAMBRIA IRON COMPANY,

Office, 218 S. Fourth St., Philadelphia.  
Chicago Office, Phoenix Building.  
(WORKS AT JOHNSTOWN, PA.)

A. & P. ROBERTS & COMPANY,  
Pencoyd Iron Works,  
MANUFACTURERS OF  
Wrought Iron and Open Hearth Steel,  
OFFICE: 261 S. 4th Street, PHILADELPHIA, Pa.

Pencoyd Bridge & Construction Co.,  
DESIGNERS AND MANUFACTURERS OF  
Bridges, Viaducts, Turn Tables, Etc.  
WORKS, PENCLOYD, PA.

A. MILNE & CO.,  
**Swedish (Norway) Iron and Steel,**  
BLOOMS, BILLETS, BARS; WIRE, RIVET AND NAIL RODS.  
FOREIGN AND DOMESTIC IRON AND STEEL.  
1 Broadway, New York. 8 Oliver Street, Boston.

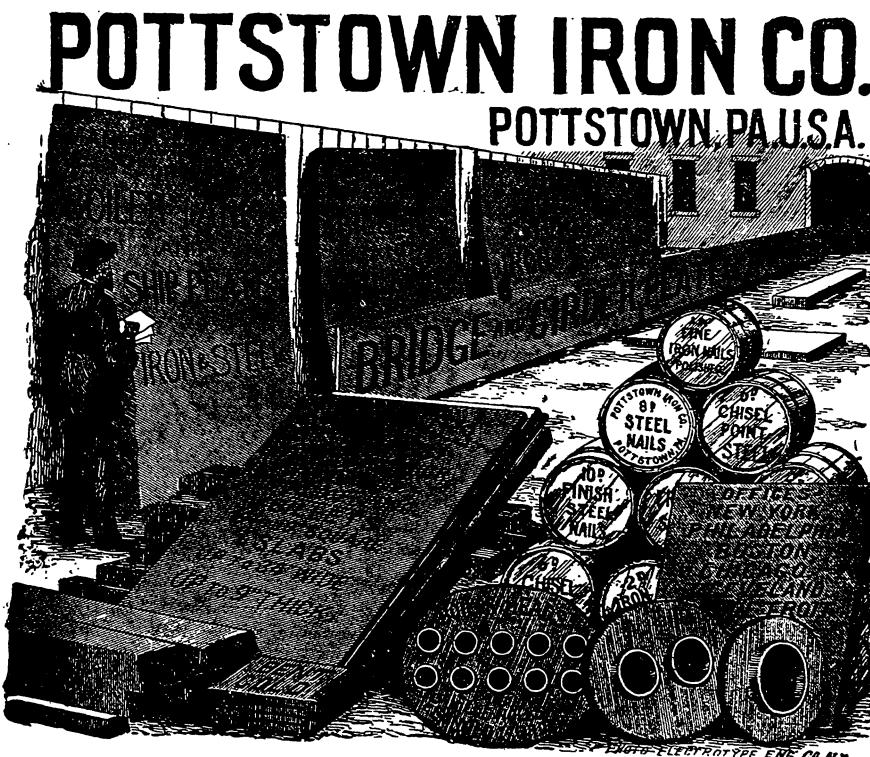
B. H. Wilson. A. Kaiser. J. B. M. Hiron.  
E. H. WILSON & CO.,  
222 and 224 South Third St., Philadelphia  
BROKERS AND DEALERS IN  
**IRON AND STEEL.**  
Correspondence solicited.

PIERSON & CO.,  
—DEALERS IN—  
**IRON and STEEL**  
OF EVERY DESCRIPTION,  
29 Broadway, cor. Morris St.,  
NEW YORK.

A. R. WHITNEY & CO.,  
MANUFACTURERS AND DEALERS IN  
**IRON and STEEL.**  
AGENCIES:—  
CARNEGIE STEEL CO., Limited, Structural  
Material, Steel and Iron Columns, Beams,  
Channels, Shaped and Plates, Steel Beams  
Reeled to 24 inches deep.  
PORTAGE IRON CO., Limited, Merchant Iron,  
Bars, Angles, Hoops and Cotton Ties.  
BROOKLYN WIRE NAIL CO., Steel Wire  
Nails, Export Nails a Specialty.  
OVERSIDE IRON WORKS, Steel Pipe.  
GLASGOW TUBE WORKS, Boiler Flues.  
AMERICAN WIRE NAIL MACHINES. Over  
900 working satisfactorily in the United  
States, 25 in Europe and 100 in Canada.  
THE SEIDELL & HASTINGS CO., Charcoal  
Iron Boiler Plates.  
Plans and estimates furnished and contracts  
made for Iron and Steel Structures of every  
description. Please address.

NORTH BROTHERS MFG. CO.  
Iron and Brass Founders,  
Light Castings a Specialty.  
N. W. Cor. 23d and Race Streets,  
PHILADELPHIA.  
Correspondence solicited.

AMERICAN  
PIG IRON STORAGE WARRANT CO.,  
(Bank of America Building) 44 Wall St., N. Y.  
Correspondence of Furnaces Invited.



FRANKFORD STEEL COMPANY.  
FRANKFORD, PHILA., PA.  
**Steel Railroad and Machine Forgings,**  
SOLID CRUCIBLE STEEL CASTINGS  
AND  
Best Grades of Tool and Machinery Steel.

CRESCE  
NT STEEL  
480 PEARL ST.  
NEW YORK  
PITTSBURGH, PA.  
64 & 66 S. CLINTON ST.  
CHICAGO.



Hundreds of testimonials showing these castings  
have proved the most satisfactory and economical  
for all purposes requiring strength and durability.

CHROME STEEL WORKS,  
Brooklyn, N. Y.

**ÆTNA-STANDARD IRON AND STEEL CO.,**

Successors to **Ætna Iron and Steel Co., and The Standard Iron Co.,** Manufacturers of  
PLATES and SHEETS, BLACK, GALVANIZED and CORRUGATED Plain Roofing, Siding and Ceiling, also of Sheet Steel, for special  
purposes, Cold Rolled or Plain and Patent Leveled.  
BARS, LIGHT SECTION RAILS, ANGLES, TEES and CHANNELS, odd sections and sizes, Machine Straightened Steel Tire, Ordinary  
Shafting, Horse-Shoe Bars, Ax-Poll Steel, Toe Calk, Nut, Bolt and Chain Rods, and other special Bars suited to every requirement.

**PROMPT SHIPMENT from STOCK.**Inquiries solicited. Stock List Mailed on Application. Address, **BRIDGEPORT, OHIO.****CARBON STEEL COMPANY, PITTSBURGH, PA.**

MANUFACTURERS OF

Universal Mill Plates.

Sheared Plates and  
Sheets.Boiler, Ship and Armor  
Plates.

Also Nickel Steel Plates.

**LIST OF SIZES SENT UPON APPLICATION.****AGENCIES:**L. S. BOOMER, 647 The Rookery, Chicago, Ill.  
GEO. KINSEY & CO., 249 West Fourth Street, Cincinnati, O.  
BULLARD & POST, 125 Milk Street, Boston, Mass.THE CONDIT-FULLER CO., Perry-Payne Building, Cleveland, O.  
JAS. G. LINDSAY & CO., Bullitt Building, Philadelphia, Pa.  
GEO. C. BEALS, Erie Co. Savings Bank Building, Buffalo, N. Y.**THE IRON FOUNDER**

A COMPREHENSIVE TREATISE ON

**The Art of Molding**

INCLUDING CHAPTERS ON

Core-making; Loam, Dry Sand and Green Sand Molding; also Crystallization, Shrinkage and Contraction of Cast Iron, and a full explanation of the science of Pressures in Molds; added to which are Formulas for Mixtures of Iron, Tables, Rules and Miscellaneous Information.

BY

**SIMPSON BOLLAND,**

Practical Molder and Manager of Foundries.

Illustrated with Over Three Hundred Engravings.  
12mo. Cloth, \$2.50.

"The Iron Founder" Supplement.

A Complete Illustrated Exposition of

**THE ART OF  
CASTING IN IRON,**

COMPRISES THE

Erection and Management of Cupolas, Reverberatory Furnaces, Blowers, Dams, Ladles, Etc.; Mixing Cast Iron; Founding of Chilled Car Wheels; Malleable Iron Castings; Foundry Equipments and Appliances; Gear Molding Machines; Molding Machines; Burning, Chilling, Softening; Annealing; Pouring and Feeding; Foundry Materials; Advanced Molding; Measurement of Castings; Wrought Iron, Steel, Etc.; also the Founding of Statues; the Art of Taking Casts; Pattern Modeling; Useful Formulas and Tables.

—BY—

**SIMPSON BOLLAND,**Practical Molder and Manager of  
Foundries; Author of "The Iron  
Founder," etc.

Illustrated with over Two Hundred Engravings

400 Pages. 12mo, cloth, \$2.50.

Sent, post-paid, on receipt of price by  
**DAVID WILLIAMS, Publisher & Bookseller**

96-102 Reade St., New York.

**R. MUSHET'S**  
**"SPECIAL," "STEEL" "TITANIC,"**  
 FOR LATHE AND PLANER TOOLS.  
 (The "Trade-Marks" of which are registered in the United States.)  
 MANUFACTURED ONLY BY  
 SAMUEL OSBORN & CO., - - - Clyde Steel & Iron Works, Sheffield, Eng.  
 SOLE REPRESENTATIVES IN THE UNITED STATES,  
**B. M. JONES & CO., Nos. 11 and 13 Oliver St., Boston.**  
 No. 143 LIBERTY STREET, NEW YORK.

**STEEL PIPE**      **STEEL NAILS**  
**RIVERSIDE IRON WORKS**  
**MANUFACTURERS**  
**STEEL**  
**PIPE**      **AND**      **NAILS**  
**WHEELING,**      **WEST VA.**  
**STEEL BLOOMS**      **STEEL RAILS**      **PIG IRON**      **STEEL SKELP**

**THE CAMBRIDGE IRON & STEEL CO.**  
 MANUFACTURERS OF



**GALVANIZED**      **SHEET IRON**  
 BLACK SHEETS FOR ROOFING & CORRUGATING  
 CORRESPONDENCE SOLICITED  
 CAPACITY RANGES FROM NO. 30  
 26 INCHES WIDE TO 1-4-40-120  
 PICKLED & COLD ROLLED FOR STAMPING  
 OFFICE & WORKS CAMBRIDGE, OHIO.

ESTABLISHED IN 1848. **SINGER, NIMICK & CO., Ltd.**

PITTSBURGH, PA.

MANUFACTURERS OF ALL KINDS OF

Hammered and Rolled

**STEEL.**

Warranted Equal to any Produced.



**HIGH GRADE SPECIAL** Crucible Tool Cast Steel, for all purposes requiring the very finest quality.  
**SINGER'S ANNEALED EXTRA** Crucible Tool Cast Steel, for Dies, Cutters, Surgical Instruments, Forceps, and all other purposes requiring an extra fine quality.

**BEST** Crucible Tool Cast Steel, for all purposes requiring steel of Standard quality, such as Turning Tools, Taps, Dies, Drills, Punches, Shear Knives, Cold Chisels, or Edge and Machinists' Tools generally, and for Mining and Quarrying purposes.

**SAW STEEL**, for Circular, Mulay, Mill, Gang, Drag, Pit and Cross-Cut Saws.

**HOT ROLLED SHEET STEEL**, for Springs, Billet Web and Hand Saws, Nicker Saws, Pocket Knives, Blades and Backs, Drawing and Stamping Cold, &c., &c.

**BRIGHT COLD ROLLED SHEET** and **STRIP STEEL**, for Cold Drawing, Stamping and Bending; for Bells, Cups, Ferrules, Springs, Keys, Chains, Sewing Machine and Type-Writer parts, and to take the place of Sheet Brass, all of unequaled finish and accuracy of gauge.

**ROUND MACHINERY STEEL**, for Shafting, Rollers, Spindles, &c., &c.

"Iron Centre" Cast Plow Steel.  
 "Soft Steel Centre" Cast Plow Steel.  
 "Soft Steel Back" Cast Plow Steel.  
 "Extra Thick Face Centre" Cast Plow Steel.

"Special" (Solid Soft Center) Plow Steel.  
 Crucible Cast Plow Steel.  
 Steel Rotary Harrow Discs.  
 Finished Rolling Plow Colters.  
 Agricultural Steel Cut to Pattern.

Also Wagon and Carriage Springs, Axles and Steel Tire.

Represented at 243 Pearl and 18 Cliff Streets, NEW YORK, by

**HOGAN & SON, General Agents for Eastern and New England States.**

GEORGE M. HOGAN, 417 Commerce St., Philadelphia; FITZ, DANA & CO., 110 North St., Boston, and

W. E. STOCKTON, 16 & 18 West Lake St., Chicago.

HUGH RUSSEL, TEMPLE BUILDING, 185 ST. JAMES ST., MONTREAL, CANADA.

**LA BELLE STEEL CO.,**

Ridge Avenue and Belmont Street, Allegheny City, Pa. Post Office Address, Pittsburgh, Pa.

MANUFACTURERS OF ALL KINDS OF **STEEL** SPRINGS, AXLES, RAKE TEETH, Etc.

**WETHERELL BROS., EASTERN REPRESENTATIVES, 31 Oliver St., Boston, and 93 Liberty St. N.Y.**

RICE, LEWIS & SON, Toronto, Ont.

**J. TATNALL LEA & CO.,**

No. 125 So. Fourth St., Philadelphia.

**BESSEMER, MILL AND FOUNDRY PIG IRON,**  
**MUCK BARS AND IRON ORES.**

— SOHO IRON & STEEL WORKS —

**MOORHEAD & MC CLEANE CO.**  
 MANUFACTURERS OF PLATE IRON & STEEL.  
 GALVANIZED PLATES (SPECIAL WIDE AND EXTRA LONG) & SHEETS (SPECIAL WIDE AND EXTRA LONG) SKELP IRONS CORRUGATED & ROOFING IRONS  
 TRADE MARK SOHO CHI  
 OFFICES AND WORKS. PITTSBURGH.

EASTERN WAREHOUSE. WESTERN WAREHOUSE.  
 No. 81 JOHN STREET, Nos. 16 & 18 W. LAKE ST.  
 NEW YORK. CHICAGO.

**W. Dewees Wood Co.,**



TRADE MARK  
 MANUFACTURERS OF PATENT  
**PLANISHED SHEET IRON.**

PATENTS :  
 Dec. 10th, 1878. Mar. 4th, 1884. Aug. 31st, 1886.  
 Jan. 10th, 1882. April 15th, 1884. Jan. 1st, 1889.  
 Jan. 1st, 1884. June 10th, 1884. Jan. 17th, 1893.  
 Feb. 12th, 1884. Jan. 6th, 1886.

Guaranteed fully equal, in all respects, to the Imported Russia Iron.

— ALSO —

Wood's Smooth Finished Sheet Irons and Sheet Steel, Cleaned and Free from Dust.

GENERAL OFFICES AND WORKS

**McKEE'SPORT, PA.**

Branch Office: 111 Water Street, Pittsburgh, Pa.

Screws and Screw Making With a Chapter on the Milling Machine; a complete treatise on Screw Making in all its branches, embracing most recent methods and containing the reports which originated modern standard screw threads. With 95 illustrations. 12mo, cloth.....\$1.25  
 For Sale by David Williams, 96-102 Reade St., N.Y.

Stay-Bolt,  
 Rivet, D. Link,  
 Axe, Hatchet,  
 Carriage and  
 Wagon Axle

**IRON.**

Superior Quality Refined Bar Iron  
 "VULCAN" AND "LOCKHART" BRANDS.  
 LOCKHART IRON & STEEL CO.  
 PITTSBURGH, PA.  
 SMALL CHANNELS AND ANGLES,  
 HEXACON IRON AND STEEL.

All Merchant Bar  
 Sizes of Soft  
 STEEL.

**"CATASAUQUA"**  
HIGH GRADE  
**Bars.**

CATASAUQUA MFG. CO.

Charles K. Barns & Co., Agents,  
224 South Fourth St., PHILADELPHIA.

**L. & R. WISTER & CO.,**  
257 So. 4th St., Philadelphia.

Dunbar Foundry and Forge Irons.  
Kemble Pig Iron.  
Tuscarawas (Black Band).  
Warner & Co's Wash Irons.

Dealers in all kinds of Scrap Iron and Steel.

**HENRY LEVIS & CO.,**  
Manufacturers' Agents

For Iron and Steel Rails, Car Wheels, Boiler  
and Sheet Iron and General  
Railway Equipments.  
Old Rails, Axles and Wheels bought and sold.  
284 S. 4th St., Philadelphia.

**Manhattan Rolling Mill.**

JOHN LEONARD,  
446 to 452 West St., New York.

MANUFACTURER OF

**HORSE SHOE AND BAR IRON**  
BLACKSMITH SUPPLIES.

**OGDEN & WALLACE,**

85, 87, 89 & 91 Elm St., New York.  
**IRON AND STEEL**

Of every description kept in stock.

Agents for Park, Brother & Co.'s  
**BLACK DIAMOND STEEL.**

All sizes of Cast and Machinery Steel constantly  
on hand.

**WILLIAM H. WALLACE & CO.,**  
**IRON AND STEEL,**

10, 12 and 14 ALBANY ST.,  
and 131 WASHINGTON ST.,  
NEW YORK.

Wm. H. Wallace. Wm. Bispham. E. C. Wallace.

**THE MAHONING VALLEY IRON CO.**

MANUFACTURERS OF  
I Bar, Band, Sheet, Plate and Tank Iron,  
Angle Iron, Nails, Boat Spikes and Rivets,

YOUNGSTOWN, OHIO.

**EXHAUST TUMBLERS,**  
Hexagon, Round or Wooden  
BEST AND CHEAPEST.

**WM. A. SWEETSER.**  
39 Montello St., Brockton, Mass.

**THE**  
**BETHLEHEM**  
**IRON COMPANY.**

SOUTH BETHLEHEM, PENNA.

**STEEL RAILS,**  
BILLETS AND MUCK BAR,

**STEEL FORGINGS.**

HOLLOW SHAFTING, CRANKS, ROLLS, GUNS AND ARMOR.  
Rough, Machined or Flashed, Fluid Compressed, Hydraulic Forged.

**NEW YORK OFFICE,** - - - 80 BROADWAY.  
**PHILADELPHIA OFFICE,** - - - 421 CHESTNUT ST.

**THE S. OBERMAYER CO.,**

Cincinnati, O., and Chicago, Ills.

MANUFACTURERS OF

**FOUNDRY FACINGS, SUPPLIES and EQUIPMENTS**

IMPORTERS AND REFINERS OF

East India Plumbago, Black Lead and Graphite.  
Brass and Iron and Steel Foundries completely equipped.

General Catalogue sent on Application.

**PASSAIC ROLLING MILL CO.,** Paterson, N. J.

MANUFACTURE

**ROLLED STEEL or IRON BEAMS**

Channels, Angles, Tees, Bars, Riveted Work, Forgings, Eye Bars, &c., &c.,

Also OPEN HEARTH STEEL BILLETS and SLABS.

NEW YORK OFFICE, - - - Rooms 151 and 152, No. 45 Broadway.

**THE MONTOUR IRON & STEEL COMPANY,**  
DANVILLE, PA.



**PIG IRON, T AND STREET RAILS,**

*Light Rails, 12 to 40 lbs. per yard.*

**RAIL JOINTS, SPIKES AND BAR IRON.**

ESTABLISHED 1850.

**ARCADE MALLEABLE IRON CO.**

WARREN McFARLAND & CO.

**Malleable Iron and Steel Castings,**

WORCESTER, MASS.

Correspondence solicited. Prices given upon receipt of patterns  
or samples.

GEO. B. BUCKINGHAM.

**THE GARTLAND FOUNDRY CO.,**

MANUFACTURERS OF

Light Work our  
Specialty. **Soft Grey Iron Castings.**

We are prepared  
to do Japanning and  
Galvanizing.

UNION and ECHO STS.,  
Cleveland, Canton & Southern R. R.,

CLEVELAND, O.

**STANDARD FOUNDRY & MFG. CO., - CLEVELAND, OHIO.**

HEADQUARTERS FOR

**LIGHT GRAY IRON CASTINGS.**

UNEQUALLED IN

**SOFTNESS and SUPERIOR FINISH.**

Our Castings in finishing will save time and tools. We solicit a trial order knowing that we can  
please you. Send samples for prices.

# CHESS BROTHERS,

MANUFACTURERS OF A FULL LINE OF

**SMALL CUT NAILS, TACKS, SHOE NAILS, ETC.**

Always in stock. Special goods made to order.

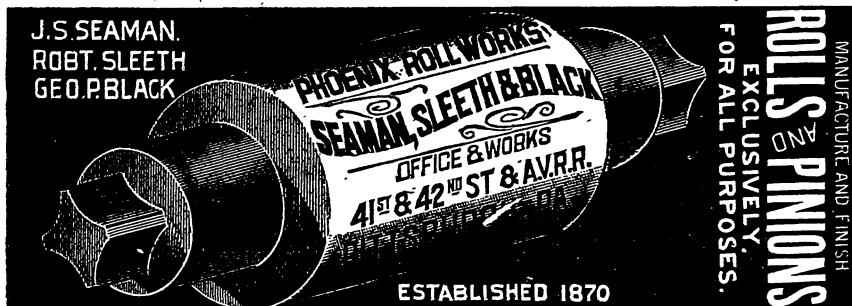
# SOFT STEEL PLATES.

Suitable for Implement manufacture and for all Blanking or Stamping uses, of good surface, rolled carefully to gauges, ranging from No. 6 to 16, inclusive; in widths up to 15½ inches and to multiples of lengths desired. Finished black or scaled. And

# EXPANDED METAL

In all its varieties of Fire-Proof Lath, Fencing, Tree Guards, &c. Send for catalogues and prices.

Office, 531 Wood St., PITTSBURGH, PA.



GEORGE MESTA, Pres.

W. D. ROWAN, Sec.

J. O. HORNING, Treas.

# LEECHBURG FOUNDRY & MACHINE CO.,

Office: LEWIS BLOCK, Pittsburgh, Pa.

Sheet and Bar Mills, Shears, Squeezers and Roll-Lathes

# ROLLS. MESTA'S PATENT PICKLING MACHINES AND TIN PLATE MACHINERY.

ESTIMATES GIVEN ON COMPLETE TIN PLATE PLANTS.

RAIL. BEAM. BAR. **ROLLS** STRUCTURAL. SPECIALS. SHAPES.

EAST CHICAGO FOUNDRY COMPANY,

Office, 716 "The Rookery,"

CHICAGO.

# COLD DRAWN STEEL SEAMLESS TUBING



The first in America. The largest and best in the world. Now prepared to make all shapes and sizes, including round square, octagon, corrugated, and half circle with double re-entering angles. Address, for samples and prices,

SHELBY, OHIO.

# The English and American Mechanic:

AN EVERY-DAY HAND-BOOK FOR THE WORKSHOP AND THE FACTORY.

CONTAINING

Several Thousand Receipts, Rules and Tables Indispensable to the Mechanic, the Artisan and the Manufacturer.

By B. Frank Van Cleve.

A new, revised, enlarged and improved edition, edited by Emory Edwards, M.E.

ILLUSTRATED WITH EIGHTY-FIVE ENGRAVINGS.

In one volume, 600 pages, 12mo, closely printed, containing a vast body of information of value to all practical men. Elegantly bound in scarlet cloth, gilt. Price \$2.00.

SENT POSTPAID, ON RECEIPT OF PRICE, BY

DAVID WILLIAMS, Publisher and Bookseller, - 96-102 Reade Street, New York.

# BIRMINGHAM IRON FOUNDRY,

BIRMINGHAM, CONN.

# CHILLED ROLLS AND ROLLING MILL MACHINERY,

McCoy Patent Mill Pinions, Shears, Rotary Squeezers.

# WIRE DRAWING MACHINERY

Special Rolling Machines for Gun Barrels, Hoes, Pick and Axe Polls, Odd Shapes and Tapers.

ESTABLISHED

1836.

# POWDER

—FOR—

Blasting, Mining and Sporting.

## ORANGE BRAND.

## ELECTRIC BLASTING APPARATUS

### SAFETY FUSE, &c.

Send postal card for Illustrated Pamphlet, showing sizes grains Powder, and describing Blasting Apparatus. Mailed FREE.

LAFLIN &amp; RAND POWDER CO.,

New York Office, 29 Murray St.

# DYNAMITE,

### RED STAR BRAND

For Mining, Quarrying &amp; Stump Blasting.

Safety Fuse, Caps, Platinum Fuse, Leading and Connecting Wire, with every other requisite for Blasting Purposes. The especial attention of the hardware trade is invited to our line of goods.

NEW YORK POWDER CO.,

62 Liberty St., New York.

# Patent Tumbling Barrels.

### MANY VARIETIES

### For all Kinds of Work.

Send for new Catalogue.

HENDERSON BROS., WATERBURY, CONN.

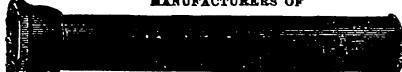
# S. CHENEY & SON, GRAY IRON CASTINGS,

CHEAP HEATING STOVES,  
DIAMOND THIMBLES,

MANLIUS, N. Y.

DONALDSON IRON COMPANY,

MANUFACTURERS OF

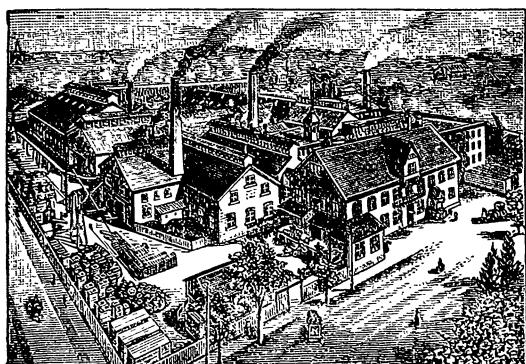


CAST IRON PIPE:  
And Special Castings for Water and Gas. Also Flange Pipe  
Emaus, Lehigh Co., Pa.

# FINE GRAY IRON

FRANKLIN IRON FOUNDRY,  
The Burr and Houston Company  
83-89 Franklin Street, Brooklyn (Green-  
point), N. Y.

Special Attention Given to Fine Castings.  
Telephone Call, Greenpoint 174.



# Sessions Foundry Co., BRISTOL, CONN.

## IRON CASTINGS TO ORDER.

We make small and large castings of all descriptions, of best quality, and at very low prices.

**CORRESPONDENCE SOLICITED.**

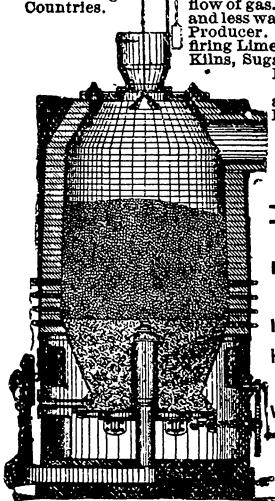
**R. D. Wood & Co.** 400 Chestnut St.  
PHILADELPHIA.

SOLE MAKERS OF THE

**TAYLOR REVOLVING-BOTTOM  
GAS PRODUCER.**

Patented in the  
United States  
and all Foreign  
Countries.

The best Producer for either  
Bituminous or Anthracite coal  
or Lignite; absolutely continuous  
in operation, as the fire is  
cleaned without stopping the  
flow of gas. Less labor required  
and less waste than in any other  
Producer. Producer Gas for  
firing Lime, Brick and Pottery  
Kilns, Sugar-house Char Kilns,  
Boilers, etc.  
Also applicable to  
all Regenerative  
Furnaces.  
Send for Pamphlet



**CAST IRON  
PIPE**

MATHEWS'  
FIRE HYDRANTS  
EDDY VALVES,  
VALVE  
INDICATOR POSTS  
Heavy Loam Castings,  
Special Machinery,  
Water Power Pumps  
and  
TURBINES.

HYDRAULIC JIB and TRAVELING CRANES,  
FREIGHT and CAR LIFTS, Etc.  
GAS HOLDERS and GAS MACHINERY.

**Law without Lawyers.**

A Compendium of Business  
and Domestic Law for  
Popular Use.

By H. B. COREY,  
Member of the New York Bar.

PRICE, \$1.00. Post-paid.

A simple, clear and accurate presentation  
of the general laws, and of the laws of the  
several States relating to the rights of prop-  
erty, contracts, debts, partnerships, bank-  
ruptcy, insurance, corporations, marriage,  
divorce, &c., &c., with which are included  
correct copies of all legal instruments and  
forms, such as notes, deeds, mortgages, leases,  
wills, &c., and a dictionary of legal words  
and phrases.

Sent, post-paid, on receipt of price by

**DAVID WILLIAMS,**

Publisher and Bookseller,

96-102 READE ST., - NEW YORK.



Soft Castings for Electrical Work and Sewing Machines. Fine Light Gray Iron Castings. Metal Patterns designed and made. Also Japanning and Galvanizing. **CLEVELAND, O.**

**STEEL  
CASTINGS**

FROM 1 to 40,000 POUNDS WEIGHT,  
Of Open Hearth, Chester or Bessemer Steel.  
True to Pattern. Sound. Solid.  
Gearing of all kinds, Crank Shafts, Knuckles for Car Couplers,  
Cross-Heads, Rockers, Piston-Heads, etc., for Locomotives.  
Steel Castings of Every Description.  
**Chester Steel Castings Co.**  
Works, Chester, Pa. Office, 407 Library St., Philadelphia, Pa.

**THE ROBINSON-REA MFG. CO.,**

**PITTSBURGH, PA.**

**SAND and CHILLED ROLLS.  
TIN PLATE PLANTS COMPLETE.**

(No. 5.)

**No. 6 RADIANT FACINGS**  
IS GOOD, IS BETTER, IS BEST.  
Foundrymen who are using it say there  
is nothing its equal. Samples free.  
Write for complete Catalogue of  
Foundry Supplies.

**THE J. D. SMITH FOUNDRY SUPPLY CO., - CINCINNATI, O.**

**DROP FORGING.**

ESTIMATES GIVEN ON APPLICATION.  
Sole Manufacturers of Ahlstrom's Patent Parallel Double  
**EXPANSION BOLTS,**  
also Single Expansion Bolts. Catalogues mailed on Application.

**W. C. BOONE MFG. CO. - Office and Factory, - BOONTON, N. J.**

**JOHN M. SOLOMON,** Successor to  
WOOD & CO.  
WILMINGTON, DELAWARE.

Fire Clays for Iron and Steel Furnaces. Furnace Sand for  
Heating Furnaces. Pits directly on P. W. & B. R. R. Samples  
on application.

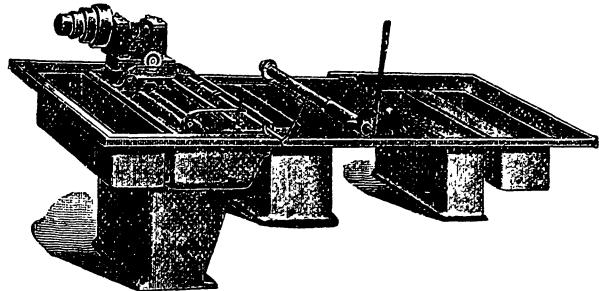
**Cranes AND Derricks.**

**W. S. HALSEY & CO., - Birdsboro, Pa.**

**M. D. VALENTINE & BRO.**  
**FIRE BRICK**  
 WOODBRIDGE, N. J.

**THE LLOYD BOOTH CO.,** YOUNGSTOWN,  
OHIO.

Tinning  
MACHINERY.



**Rolling Mills,**  
Sand and Chill  
ROLLS.

GRAY IRON, BRASS, ALUMINUM and ALUMINUM BRONZE CASTINGS  
of the very best quality.

Very much time saved by using clean and soft castings. We use only the best material. A trial will convince you. PICKETS and ROSETTES for Wire Workers. Catalogue of same. NICKEL PLATING and JAPANNING, also METAL PATTERN MAKING and LIGHT MACHINE WORK. We invite correspondence.

HAIGHT & CLARK, - - - - - ALCBANY, N. Y.

**DROP FORGINGS**

OF EVERY DESCRIPTION, IN IRON, STEEL, COPPER and ALUMINUM.

Hoist Hooks, Shafting Collars, Eye Bolts, Wrenches, Machine Handles, Fence Ornaments. SPECIAL ATTENTION GIVEN TO THE MANUFACTURE OF

**SPECIAL FORGINGS.**

**PHILADELPHIA DROP FORCE COMPANY,**

Office and Works, S. E. Cor. American and York Sts., Philadelphia.  
New York Agents: BATT, BONNELL & THOMPSON, 34 Dey Street, N. Y.

JOHN H. RICKETSON, Pres.

A. G. BARNETT, Treas.

W. L. RICKETSON, Supt.

O. G. RICKETSON, Vice-Prest.

A. G. MCCLINTOCK, Sec'y.

**A. GARRISON FOUNDRY CO.,**

Manufacturers of Sand, Patent Homogeneous Steel and

**CHILLED ROLLS.**

Ore and Clay Pulverizers, Rotary Squeezers, Haskin's Patent Double Spiral Pinions and Rolling Mill Castings of every description.

Office: Nos. 10 & 12 Wood St., - PITTSBURGH, PA.

**WESTERN FOUNDRY COMPANY,  
LIGHT GRAY IRON CASTINGS.**

OFFICE: 813 Royal Insurance Building,

Chicago, Ill. Telephone, Main 559.

WORKS: Albany Ave., near 38th St.

Telephone, Yards 805.

Correspondence Solicited. We do Japanning, Galvanizing and Nickel Plating.

Haines Gauge Co.,

906 Filbert St.,

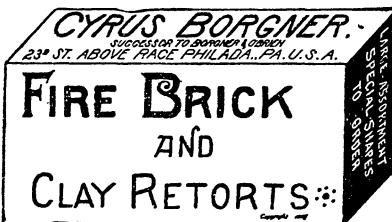
PHILADELPHIA,  
PA., U. S. A.



The HAINES Automatic Micrometer Rolling  
MILL GAUGE.  
For reducing HOT WORK in process of rolling.

**DROP FORGED**

MERRILL BROS., 465 to 471 Kent Ave., Brooklyn, E.D., N. Y.



**MCLEOD & HENRY CO.**

**FIRE BRICK**

TROY, N. Y.

ESTABLISHED 1856.

HENRY MAURER & SON,

MANUFACTURERS OF

**FIRE BRICK**

of all Shapes and Sizes,

420 E. 23d St., New York.

**B. KREISCHER & SONS,  
FIRE BRICK**

BEST AND CHEAPEST.

ESTABLISHED 1845.

Office, foot of Houston Street, East River, NEW YORK.

ESTABLISHED 1864.

**JAMES GARDNER & SON,**

MANUFACTURERS OF

**"STANDARD SAVAGE" FIRE BRICK**

TILE and FURNACE BLOCKS

OF ALL SHAPES AND SIZES.

WORKS, Ellerslie, Allegheny Co., Md.

OFFICE, Cumberland, Md., P. O. Box 540.

S. M. Hamilton & Co., Agents, - Baltimore, Md.

Stowe, Fuller & Co., Agents, - Cleveland, O.

Established 1848.

**OSTRANDER FIRE BRICK CO.,**

Manufacturers of

**FIRE BRICK**

FOR ALL PURPOSES.

TROY, N. Y.

**A Trial will  
Convince You**

THAT WE MAKE

SOFT AND SMOOTH

Light Gray Iron Castings,

-- SOUND --

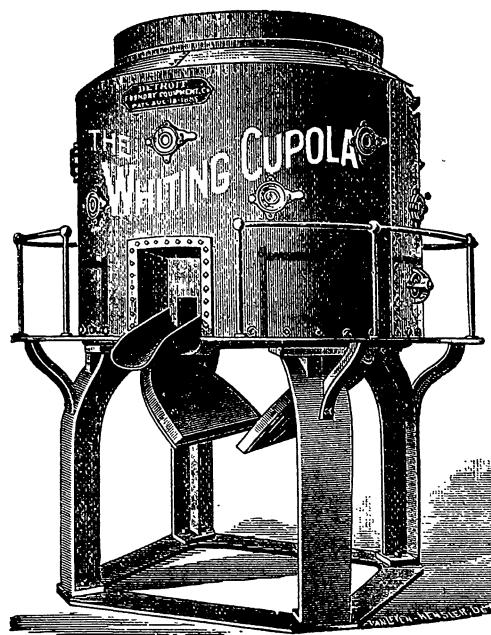
Brass and Bronze Castings

TRUE TO THE PATTERN.

Also HAVE FACILITIES FOR FINISHING.

Sample for estimate solicited.

I. S. SPENCER'S SONS, Guilford, Conn.



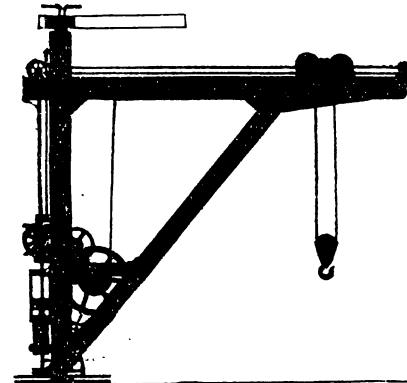
THE WHITING PATENT CUPOLA.

# THE WHITING PATENT CUPOLA.

Unequaled for Economy.

Made in twelve sizes.

Send for descriptive circulars, testimonials and full particulars. Prices were never before so favorable to intending purchasers.



**Detroit Foundry Equipment Co.,**

Designers and Manufacturers.

## CRANES,

LADLES, TUMBLERS, TRUCKS, FOUNDRY ELEVATORS, SAND SIFTERS, &C.

COMPLETE FOUNDRY PLANTS.

CHICAGO:

225 Dearborn Street.

DETROIT:

Michigan Avenue & D. & B. C. Ry.

NEW YORK:

182 Front Street.

## BOOKS ON MECHANICAL AND STEAM ENGINEERING.

### Modern American Locomotive Engines,

their Design, Construction and Management. A practical work for practical men By EMORY EDWARDS, M. E. Illustrated by 78 engravings; 383 pages; cloth.....\$2

### Engineers' Sketch Book.

By THOMAS WALTER BARBER, engineer. Nearly 2000 illustrations, descriptive notes and memoranda; 243 pages; cloth.....\$3

### Locomotive Engine Running and Management.

A practical treatise on the locomotive engines, showing their performance in running different kinds of trains with economy and dispatch; also directions regarding the care, management and repairs of locomotives and all their connections. Illustrated by numerous engravings. Seventeenth edition By ANGUS SINCLAIR, M. E. Cloth.....\$2

### Stationary Steam Engines.

Especially adapted to electric lighting purposes. Treating of the development of steam engines—the principles of construction and economy, with descriptions of moderate speed and high speed engines. By Prof. R. H. THURSTON. Fourth edition; 177 pages cloth.....\$1.50

### Thermo-Dynamics, Heat Motors, and Refrigerating Machines

By PROF. DE VOLSON WOOD. Third edition, revised and enlarged; 452 pages; cloth....\$4

### Mechanics' and Engineers' Pocket Book.

By CHAS. H. HASWELL. Fifty-fifth edition; 856 pages; leather.....\$4

### Manager's Hand-Book of Modern Rules,

Tables and Data for Civil and Mechanical Engineers, Millwrights and Boiler Makers, Tool Makers, Machinists and Metal Workers' Iron and Brass Founders, &c. By W. S. HUTTON. Thick 8vo, half-bound.....\$6

### Valve Gears.

Analysis by Zeuner Diagram. By H. W. SPANGLER, P. A. Engr. U. S. Navy; 160 illustrations; cloth.....\$2.50

### The New Catechism of the Locomotive.

Rewritten and enlarged with new matter and illustrations selected from the latest practice in this country. By M. N. FORNEY; 709 pages; cloth.....\$3.50

### A Treatise on Toothed Gearing,

Containing complete instructions of designing, drawing and constructing spur wheels, bevel wheels, lantern gear, screw gear, worms, &c., and the proper formation of tooth profiles. For the use of machinists, pattern makers, draftsmen, designers scientific schools, &c. With many plates. By J. HOWARD CROMWELL, Ph. B. Third edition; 245 pages; cloth.....\$1.50

### Richards' Steam Engine Indicator.

A treatise on the development and application of force in the steam engine. Fourth edition, revised and enlarged. By C. T. PORTER. 273 pages; 20 plates; cloth.....\$3

### Complete Practical Machinist.

By JOSHUA ROSE. Embracing lathe work, vise work, drills and drilling, taps and dies, hardening and tempering, the making and use of tools, &c. Fifteenth edition; 356 illustrations; 450 pages.....\$2.50

### A Treatise on Belts and Pulleys

Embracing full explanations on fundamental principles, proper disposition of pulleys, rules for determining widths of leather and vulcanized rubber belts and belts running over covered pulleys; strength and proportions of pulleys, drums, &c.; together with the principles and necessary rules for rope gearing and transmission of power by means of metallic cables. By J. HOWARD CROMWELL, Ph. B., author of a Treatise on Toothed Gearing; 271 pages; cloth.....\$1.50

### Lathe Work.

A practical treatise on the tools, appliances and processes employed in the art of turning, including hand turning, boring and drilling, the use of slide rests and overhead gear, screw cutting by hand and self-acting motion, wheel cutting, &c. By PAUL N. HASLUCK. Fourth edition, revised and enlarged; 212 pages, 51 cuts; cloth.....\$3

Sent, Post-paid, on Receipt of Price, by

**DAVID WILLIAMS.**

— — — — — Publisher and Bookseller,  
96-102 Reade Street, New York.

JAMES BEMPHILL, President.  
WM. H. CONLEY, Treasurer.

THOS. B. RITER Vice-President.  
JNO. F. WILCOX, Gen'l Manager.

# PITTSBURG IRON & STEEL ENGINEERING CO.

LEWIS BLOCK, PITTSBURG, PA., U. S. A.

## BESSEMER AND OPEN-HEARTH STEEL PLANTS.

Rolling Mills (Blooming, Rail, Plate, &c). Blast Furnaces, Engines  
Boilers, Bridges, Girders, Iron Buildings.

WORKS BUILT COMPLETE and Fully Equipped for Operation.

## THE D. R. LEAN COMPANY, Blast Furnace and Steel Plant Construction,

Penn Building, Pittsburgh, Pa.

J. A. HERRICK, M. E.,  
Consulting Engineer and Contractor:  
Room 609, 284 Pearl Street, NEW YORK.  
— STEEL CASTING PLANTS A SPECIALTY.—  
Melting and Heating Furnaces of ALL KINDS.  
Patent Gas WATER VALVES. Improved "BASIC" and "SEMI-  
STEEL" Processes and FURNACES.  
New CONTINUOUS Gas PRODUCERS.

### Corliss Steam Engines,

Simple, Compound and Triple  
Expansion, Condensing and  
Non-Condensing.



### Tanks and Stand Pipes.



Feed Water Heaters.  
Steel Plate Chimneys.  
Air Pumps and Condensers.

### Philadelphia Engineering Works,

LIMITED,

Mifflin Street, East of Front Street, Philadelphia, Pa.

Long Distance Telephone, 1781. - - - - -

TENSILE STRAIN. } 56,000 to 64,000 lbs.



CAPACITY. { Plates 1 inch thick to No. 12.  
30 feet long.  
70 inches wide.

WM. McILVAIN & SONS,

READING, PA.,

MANUFACTURERS OF

## IRON AND STEEL BOILER PLATES

Locomotive, Fire Box, Flange, Shell,  
Tank Iron and Steel, including Plates for  
Bridges, Girders, Stacks, Pipe and Fire  
and Burglar-proof Safes.

### THE ALLENTOWN ROLLING MILLS,

MANUFACTURERS OF

Pig Iron, Merchant Bar Iron, Rolled Shafting, Mine Rails, I-Beams, Tee Bars, Fish  
Plates, Bolts, Nuts and Spikes.

Transfer and Locomotive Turn Tables, Blast Furnace, Rolling Mill and Mining Ma-  
chinery, Mining Pumps, Etc. Roll Trains, Shears, Punches, Iron Trucks, Etc. Builders  
of all classes of Machinery. Makers of Castings of all descriptions for Cable and  
Electric Railway.

ALLENTOWN, PA.

## McCLURE & AMSLER, Engineers and Contractors,

Bissell Block, Pittsburgh, Pa.

## BLAST FURNACE CONSTRUCTION A SPECIALTY.

General Agents for Massick's and Crooke's Patent Fire Brick Stoves; Designs and Estimates for the construction of Blast Furnace Work, and for all kinds of Hot Blast Fire Brick or Pipe Stoves; and all other kinds of Brick Work pertaining to Steel Plants, Iron, Brick or Wooden Buildings, all kinds of Iron Construction in general.

We propose to put into successful operation all the plants we design and construct for.

## The Iron-Masters' LABORATORY

Exclusively for the  
Analysis of Ores of Iron, Pig and Manufactured Iron, Steels, Limestone, Clays, Slags and Coal for Practical Metallurgical Purposes.

Branch Office, 339 Walnut St., Philadelphia.

All Analytical Work at Warrenton, Virginia.

J. BLODGET BRITTON.

This laboratory was established in 1866, at the instance of a number of practical Iron Masters, expressly to afford prompt and reliable information upon the chemical composition of the substances above mentioned, for smelting and refining purposes, the object being to make it at once a convenient, practically useful, and comparatively inexpensive adjunct to the Furnace, Forge and Rolling Mill.

## The Practical Brass and Iron Founder's Guide,

A Treatise on Brass Founding, Molding, the Metals and their Alloys, etc.

By JAMES LARKIN.

Late Conductor of the Brass Foundry Department of the Penn Works, Philadelphia.

A New Revised and Greatly Enlarged Edition.

### CONTENTS :

Among the most important and entirely new sections of this edition of this valuable and popular book are the following:

Behavior of Metals and Alloys in Melting and Congealing; Malleable Iron Castings; Wrought Iron or Mitis Castings; Manufacture of Steel Castings; Casting of Brass; Casting of Bronze; Bell Founding; Chill Casting; Casting without Core; Casting on to other Metals; Casting Iron and other Metals upon Lace, Embroideries, Fern Leaves and other Combustible Materials; Some Modern Bronzes.

In one volume, 12mo, 400 pages, \$2.50.

Sent, post-paid, on receipt of price by

DAVID WILLIAMS,

Bookseller and Publisher,

96 - 102 READE ST., N. Y.

# Tool Steel

# TRETHEWEY MFG. CO., - 47th ST., PITTSBURGH, PA.

MANUFACTURERS OF

**Dies**  
**Of any size.**

Forgings of Machinery or Tool Steel, Rolling Mill Machinery, Steam Hammers, Squaring Shears, Double Headed Rotary Shears, Shear Grinding Machinery, Circle Cutting Machines, Roll Lathes, Hardened Forged Steel Rolls, Roll Turning Tools, Solid Steel Shear Knives.

**ALEX LAUGHLIN & CO.**

LEWIS BLOCK, PITTSBURGH, PA.

Gas Heating  
Gas Puddling  
Open Hearth  
Crucible  
Tube Welding

**FURNACES**

AND ARTIFICIAL GAS PRODUCERS OF  
EVERY DESCRIPTION, for ROLLING MILLS,  
STEEL AND TUBE WORKS.

We guarantee to place all Plants erected by  
us in successful operation

M. V. SMITH, PRES.  
C. C. MORROW, SEC.

M. A. GREENE, VICE-PRES.  
JOHN A. ELLIOTT, TREAS.

**Artificial Gas  
Engineering Co.,**  
Consulting and Contracting  
**ENGINEERS.**

ARTIFICIAL GAS applied to all Branches  
of Manufacturing and Domestic Uses.  
Apparatus for the Manufacture of  
Coal-Gas Furnished at Lowest Prices

**706 TIMES BUILDING,  
PITTSBURGH, PA.**

**HENRY AIKEN,**  
Consulting Mechanical Engineer,

Rooms 203-206 Lewis Block,  
PITTSBURGH, PA.

**VULCAN IRON WORKS**  
CHICAGO  
**PULP DRIVERS**

**BEVEL GEARS**  
PLANED PERFECTLY BY PATENTED PROCESS  
**GLEASON TOOL CO.**  
ROCHESTER, N.Y.

Electric Traction on Railways and Tramways. By A. BEEKENZAUN. The author has endeavored in this book to summarize as concisely as possible the present state of electric traction and to describe the various methods and constructive details which are to-day in use or which have marked consecutive steps in the development of the art. 213 illustrations, 12mo, cloth, ..... \$4.00

For sale by David Williams, 196-102 Reade St., N.Y.

**THE S. R. SMYTHE COMPANY,**  
ENGINEERS AND CONTRACTORS, PITTSBURGH, PA.

**Regenerative Gas Furnaces and Gas Producers  
For All Purposes.**

TUBE, STEEL, ROLLING MILLS, GLASS WORKS CONSTRUCTION, Etc.

We contract for complete Plants, guarantee results and operation. OVER 100  
PLANTS BUILT AND WORKING.

McAULEY FEED WATER HEATER AND PURIFIER. Clean Boilers Guaranteed at  
small cost. No scale, better service, and saving in fuel.

**JULIAN KENNEDY.**  
Consulting and Contracting Engineer,

Rooms 36, 37, 38, 39 Vandergrift Building, Pittsburgh, Pa.

Blast Furnaces, Bessemer and Open Hearth Steel Works, Rolling Mills.

STEAM AND HYDRAULIC MACHINERY, &amp;c.

Branch Office of The Latrobe Steel Works.—

**Wm. Swindell & Bros.,**  
ENGINEERS AND CONTRACTORS,

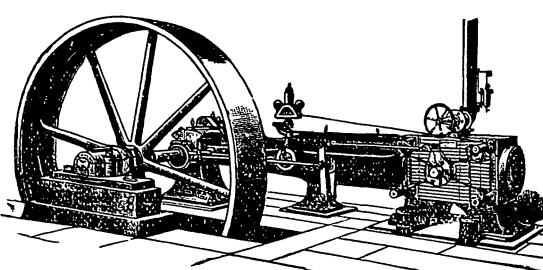
Regenerative and Recuperative Gas Furnaces for  
Steel, Iron and Glass.

**SWINDELL'S IMPROVED GAS PRODUCERS,**  
243 BUILT SINCE APRIL 1, 1891.

P. O. Box 945.

548 Smithfield St., Pittsburgh, Pa.

**THE LANE & BODLEY CO.,**



Cincinnati, O.  
**ENGINES,**

ALL SIZES  
Simple and Compound,  
CORLISS ENGINES A SPECIALTY.

Heavy Slide Valve Engines.  
Shafting, Hangers, Pulleys,  
Belt Elevator, etc.

**BOILERS.**

We make a better stationary tubular boiler, make it of flange steel, with weldless braces and eclipse manholes, and sell them for one-third less than the old style. Send for lithographs and detail illustrations.

Fulton Steam Boiler Wks. & F'dy,  
RICHMOND, IND.

Strong, Well Built, Serviceable  
ADAPTED TO  
HEAVY  
CONTINUOUS  
WORK

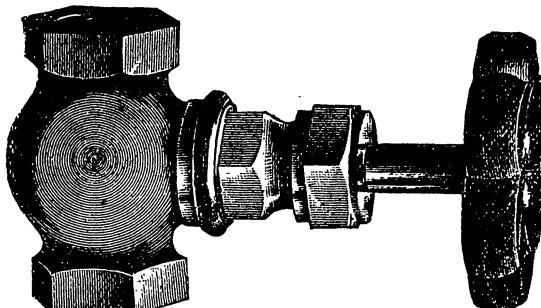
**STEAM ENGINES** SINGLE OR  
DOUBLE.  
**BOILERS** TUBULAR AND  
CIRCULAR FIRE-BOX.  
AND MULAY **SAW MILLS**  
IN STOCK FOR IMMEDIATE DELIVERY.  
FOR DESCRIPTIVE CATALOGUES ADDRESS  
CHANDLER & TAYLOR CO., INDIANAPOLIS, IND.

BLAST FURNACES,  
ROLLING MILLS,  
STEEL WORKS,  
MINES, ETC.,  
ETC.

WILLIAM R. MULBROOK & CO.



OIL WELLS,  
REFINERIES,  
ELECTRIC LIGHT PLANT,  
WATER WORKS, ETC.,  
ETC.



McNAB & HARLIN MFG. CO.,

MANUFACTURERS OF

BRASS COCKS AND VALVES

For Steam, Water and Gas.

Wrought Iron Pipe and Fittings. Plumbers' Materials. Seamless  
Brass and Copper Tubes.

Factory, PATERSON, N. J.

56 JOHN ST., N. Y.

Catalogue and Price-List will be sent to the Trade with their first order, or by express, if desired, before ordering.



THE CONTINENTAL IRON WORKS

West and Calyer Streets, BROOKLYN, N. Y.,

SOLE MANUFACTURERS OF

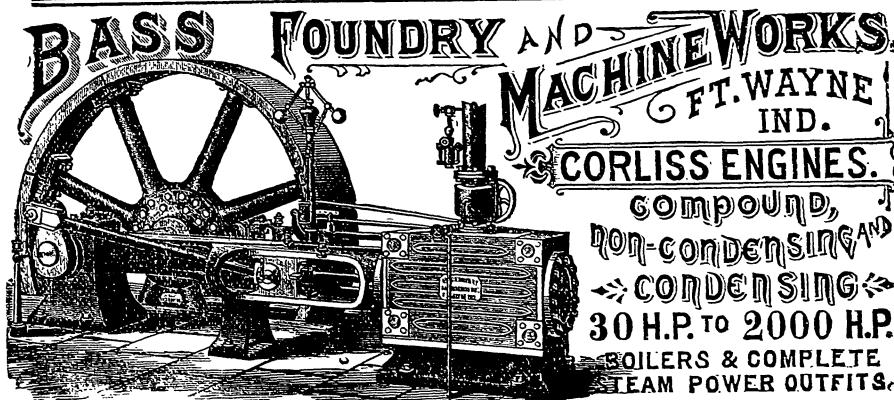
CORRUGATED FURNACES, FOR MARINE AND  
LAND BOILERS.

Made in sizes from 28 in. to 60 in. diameter, with flanged or plain ends.

Thos. F. Rowland, Pres.  
Thos. F. Rowland, Jr., Treas.

Warren E. Hill, Vice-Pres.  
Chas. H. Corbett,

Take Ferry from East 10th or 93d Streets, N. Y., to Greenpoint.



BASS FOUNDRY AND  
MACHINE WORKS,  
FT. WAYNE  
IND.

CORLISS ENGINES.  
COMPOUND,  
NON-CONDENSING  
CONDENSING  
30 H.P. TO 2000 H.P.  
BOILERS & COMPLETE  
STEAM POWER OUTFITS.

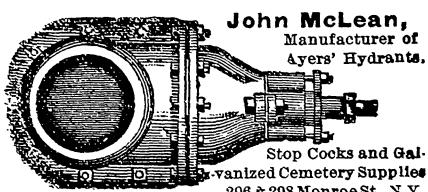
OIL AND  
WATER  
EASILY AND COMPLETELY RE-  
MOVED FROM  
STEAM

BY OUR  
Cochrane Separators  
FOR HORIZONTAL OR VERTICAL  
PIPES.

FOR PARTICULARS ADDRESS  
Harrison Safety Boiler Wks.,  
Germantown Junction. PHILADELPHIA, PA.

WILLIAM TOD & CO.  
YOUNGSTOWN, OHIO.  
SINGLE, COMPOUND  
AND CONDENSING.  
PORTER-HAMILTON  
ENGINE  
Blowing Engines,  
Hydraulic Cranes & Accumulators  
Heavy Special Machinery.  
ENGINE CATALOGUE ON APPLICATION.

THE  
Totten & Hogg I. & S. F'dry Co.,  
Manufacturers of  
The "Atna" Rolling Mill  
ENGINE  
Chilled and Sand  
Rolls and Rolling Mill  
Machinery,  
PITTSTURGH, PA.



John McLean,  
Manufacturer of  
Ayers' Hydrants.

Stop Cocks and Gal-  
vanized Cemetery Supplies  
296 & 298 Monroe St., N.Y.

GEARS

Every style large or small. (See Catalogue).  
BOSTON GEAR WORKS, 37 Hartford St., Boston, Mass.

ESTABLISHED 1870. INCORPORATED 1893.  
**ERIE ENGINE WORKS**  
 (CLEVELAND & HARDWICK.)  
  
**ERIE, PA.**  
 Manufacturers of  
**STEAM ENGINES  
 AND BOILERS.**

## BOOKS

—ON—

### Mechanical <sup>AND</sup> Steam Engineering.

**A Manual of Steam Boilers,**  
 their designs, construction and operation.  
 For technical schools and engineers. By  
 PROF. R. H. THURSTON. Second edition;  
 183 engravings in text; 671 pages; cloth...\$5

#### The Slide Valve Practically explained.

Embracing simple and complete practical  
 demonstrations of the operation of each  
 element in a slide-valve movement, and  
 illustrating the effects of variations in their  
 proportions by examples carefully selected  
 from the most recent and successful practice.  
 By JOSHUA ROSE, M. E. Illustrated by 35  
 engravings; 100 pages; cloth.....\$1

#### Twenty Years with the Indicator.

Being a practical text book for the engineer  
 or the student, with no complex formulæ.  
 By THOMAS PRAY, JR., consulting, construct-  
 ing, civil and mechanical engineer, &c.  
 Newly arranged; complete in one volume;  
 284 pages; cloth.....\$2.50

#### The English and American Me- chanic.

An every-day handbook for the workshop  
 and factory, containing several thousand re-  
 ceipts, rules and tables indispensable to the  
 mechanic, the artisan and the manufacturer.  
 By B. FRANK VAN CLEVE. A new enlarged  
 edition by EMORY EDWARDS, M. E. 476 pages  
 illustrated; cloth.....\$2

#### Constructive Steam Engineer- ing.

A descriptive treatise, embracing engines,  
 pumps and boilers and their accessories and  
 appendages. By JAY M. WHITHAM, M. E.,  
 C. E. 900 pages; 795 illustrations, many of  
 which are full page and folding plates;  
 cloth.....\$10

#### The American Steam Engineer.

Theoretical and practical, with examples of  
 the latest and most approved American  
 practice in the design and construction of  
 steam engines and boilers of every descrip-  
 tion. For the use of engineers, machinists,  
 boiler makers and students. By EMORY  
 EDWARDS, M. E. Illustrated by 77 engrav-  
 ings; 419 pages; cloth.....\$2.50

Any Book published sent, post-paid, upon  
 receipt of price, by

**DAVID WILLIAMS,**

Publisher and Bookseller,

96 - 102 Reade St., New York.

CLOSE REGULATION.  
 HIGH ECONOMY.



CHICAGO, 554 ROOKERY.  
 ST. LOUIS, 32 LACLEDE BLDG.

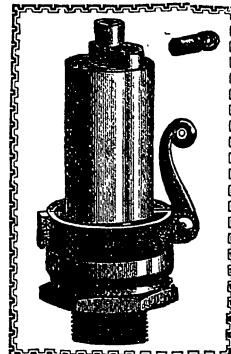
**SOUTHWARK FOUNDRY  
 —AND—  
 MACHINE COMPANY,**  
 Philadelphia, Pa.  
 Sole Makers of  
**THE PORTER-ALLEN  
 AUTOMATIC ENGINE,**  
 SIMPLE, COMPOUND  
 OR TRIPLE EXPANSION.  
 Also Builders of  
**BLOWING ENGINES,  
 REVERSING ENGINES,  
 CENTRIFUGAL PUMPS,  
 BOILERS, TANKS, ETC.**

## POP SAFETY VALVES

Are a necessity, and it is very important, therefore, to have the best—one that is **durable, simple, reliable** and **accurate**.

“Lunkenheimer’s” fills the bill. It has a **large** spring, **full** relieving capacity, and is very **sensitive**.

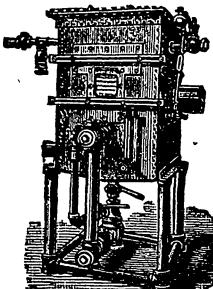
Every Valve thoroughly tested and warranted. For sale by dealers. **Specify and insist** on “LUNKENHEIMER’S” make, and you will make no mistake. All goods warranted. We make other goods—get our catalogue.



**THE LUNKENHEIMER COMPANY, Cincinnati, O., U. S. A.**

## WE GUARANTEE YOU

*a very considerable saving in the items of water and fuel by the use of our Vacuum Feed Water Heater and Purifier, and this means, of course, an extra profit on your output. The “how” will be found in a comprehensive Catalogue, which is yours for the asking, also Catalogues of the Webster Separator and Williams Vacuum System of Steam Heating.*



**WARREN WEBSTER & CO.,**

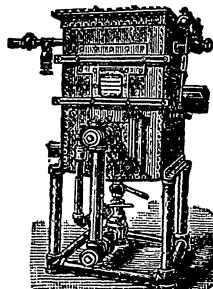
NEW YORK, 126 Liberty Street.  
 CHICAGO, Monadnock Building.

No. 2.

**CAMDEN, N. J.**

## WE NEVER SOLD ONE

*of our Vacuum Feed Water Heaters and Purifiers until we had first satisfied our customer that it was capable of saving money for him. Our Catalogue will make this saving clear to you. Shall we mail it? We also build the Webster Separator and Williams Vacuum System of Steam Heating.*



**WARREN WEBSTER & CO.,**

NEW YORK, 126 Liberty Street.  
 CHICAGO, Monadnock Building.

No. 5.

**CAMDEN, N. J.**

## BOOKS.

YOU CAN OBTAIN PROMPTLY the latest work on any subject in which you are interested by addressing DAVID WILLIAMS, Publisher and Bookseller, 96-102 Reade Street, New York.



# THOROUGH INSPECTIONS

And Insurance against loss or damage to property and loss of life and  
injury to persons caused by

## Steam Boiler Explosions

J. M. ALLEN, Pres. WM. B. FRANKLIN, Vice-Pres. F. B. ALLEN, 2d Vice-Pres. J. B. PIERCE, Sec. and Treas.

### BOARD OF DIRECTORS:

J. M. ALLEN, President.  
FRANK W. CHENEY, of Cheney Brothers Silk Manufacturing Co.  
CHARLES M. BEACH, of Beach & Co.  
DANIEL PHILLIPS, of Adams Express Company.  
RICHARD W. H. JARVIS, President Colt's Fire Arms Manufacturing Co.  
THOMAS O. ENDERS, of the United States Bank.  
LEVERETT BRAINARD, of the Case, Lockwood & Brainard Co.  
GEN. WM. B. FRANKLIN, late Vice-President Colt's Pat. Fire Arms Mfg. Co.  
NELSON HOLLISTER, of the State Bank, Hartford.

HON. HENRY C. ROBINSON, Attorney at Law, Hartford.  
HON. FRANCIS B. COOLEY, of the National Exchange Bank, Hartford, Conn.  
A. W. JILLSON, late Vice-Prest. Phoenix Fire Insurance Co., Hartford, Conn.  
EDMUND A. STEADMAN, President of the Fidelity Co., Hartford, Conn.  
GEORGE BURNHAM, Baldwin Locomotive Works, Philadelphia.  
HON. NATHANIEL SHIPMAN, Judge U. S. Circuit Court.  
C. C. KIMBALL, Prest. Smythe Manufacturing Co., Hartford, Conn.  
PHILIP CORBIN, of P. & F. Corbin, New Britain, Conn.

## THE EYNON-EVANS MANUFACTURING CO.,

Patentees and Manufacturers of **THE EYNON-KORTING COMPOUND INJECTORS.**

Extra Heavy Globe and Angle Valves.  Brass Castings up to 5000 lbs.

Blowers, Ventilators, Blast Nozzles, Exhausters, Brass Siphons, Acid Siphons, Condensers.

Fifteenth and Clearfield Sts., Philadelphia, Pa.



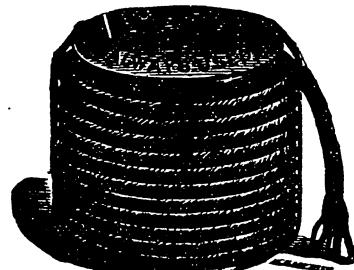
SEND FOR CATALOGUE A.

**Pennsylvania Diamond Drill & Manufacturing Co.**  
BIRDSBORO, PA.

Drill Press and Planer Chucks. Steam and Gas Engines. Diamond Pointed Core Prospecting Drills. Boiler Fronts and General Castings. Mineral Lands Prospected and Artesian Wells Pored by Contract.

CHICAGO MACHINERY & ENGINEERING CO., Western Sales Agents, Chicago.

**ROLLASON GAS ENGINES.**  
RELIABLE AND ECONOMICAL  
Send for Catalogue, etc. HAVEMEYER BLDG. NEW YORK



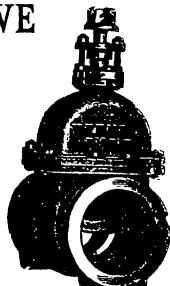
Send for a Sample of  
Morrison's Patent Self-Lubricating Packing,  
ROBT. MORRISON,  
5034 Arsenal St., St. Louis, Mo.

**CHAPMAN VALVE MFG. CO.**

Manufacturers of  
**VALVES & GATES**

For Water, Steam, Gas,  
Ammonia, &c.

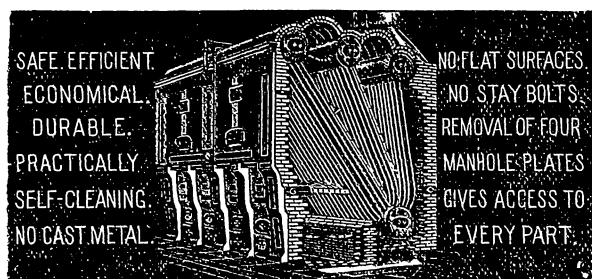
**GATE FIRE HYDRANTS,**  
With and without independent outlets.



We make a specialty of Valves with Bronze seats for High Pressure steam.  
Works and General Office,

**INDIAN ORCHARD, MASS.**  
Treasurer's Office,  
72 Kilby and 112 Milk Streets,  
Boston, Mass.

Chicago Office, 24 West Lake St. New York Office,  
28 Platt Street.  
  
Hicks' Builders' Guide.—Comprising an easy, practical system of estimating material and labor for carpenters, contractors and builders. A comprehensive guide to those engaged in the various branches of the building trades. By I. P. Hicks; illustrated by numerous engravings of original drawings. 180 pages; cloth ..... \$1.00  
For sale by David Williams, 96-102 Reade St., N. Y.



# THE STIRLING WATER TUBE SAFETY BOILER.

74 Cortlandt St., New York.  
418 Walnut St., Phila.  
Cuyahoga Building, Cleveland.

THE STIRLING CO.,  
Gen'l Offices, Pullman Building,  
CHICAGO, ILL.

## POWER FROM GASOLINE.

DIRECT FROM THE TANK.

CHEAPER THAN STEAM. No Boiler. No Steam. No Engineer.

FOR USE EVERYWHERE.

OTTO GASOLINE ENGINES, Stationary or Portable.

1 to 50 H. P. 8 to 20 H. P.

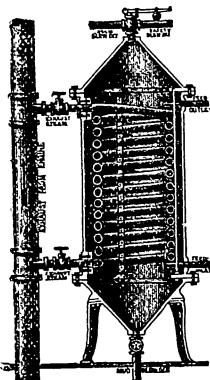
Running Expenses, Less than one cent per horse power per hour. For large engines, one-half cent per horse power per hour. Suitable for all manufacturing purposes. Electric Lighting, Town Water Supply. The Best Auxiliary Power for Night Work.

OTTO GAS ENGINE WORKS,

33d and Walnut Sts., PHILADELPHIA, PA.

CHICAGO OFFICE: 245 Lake St.

BOSTON OFFICE: 19 Pearl St.



## THE AMERICAN FEED WATER HEATER

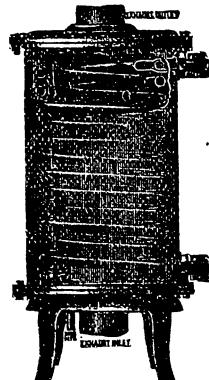
Received the First Prize at the  
Mechanics' Association Fair, - - - - - Boston, Mass.

What you get when you buy the AMERICAN HEATERS:

COPPER COILS,  
SOLIDLY BRAZED,  
GUN METAL FITTINGS  
AND CLAMP STAYS,  
STEEL SHELLS,

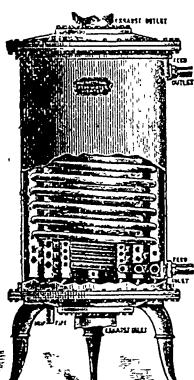
NO RUSTING OUT,  
NO LEAKY JOINTS,  
NO TROUBLE FROM EXPANSION,  
NO BACK PRESSURE,  
NO OIL IN BOILER.

We guarantee this Heater to be the Most Durable, Effective and Cheapest



WHITLOCK COIL PIPE CO.,

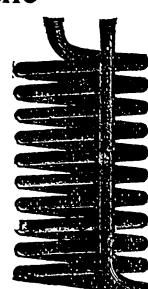
27 South Street, - - - - - Elmwood, Conn.



## The National Feed Water Heater

is a BRASS COIL HEATER, delivering water to the  
boilers at 212° Fahrenheit. It is low in price, but  
unequalled in efficiency. 500,000 H. P. in daily use  
attests its merits.

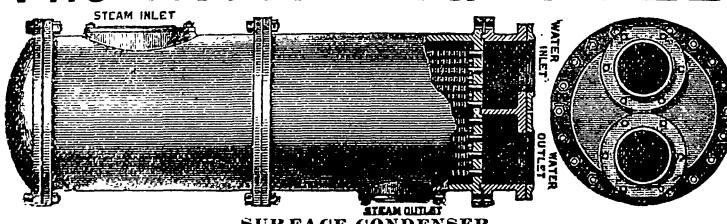
Coils and Bends of Iron, Brass, and Copper Pipe.



THE NATIONAL PIPE BENDING CO.,

98 River St., New Haven, Conn.

## The WAINWRIGHT FEED WATER HEATER

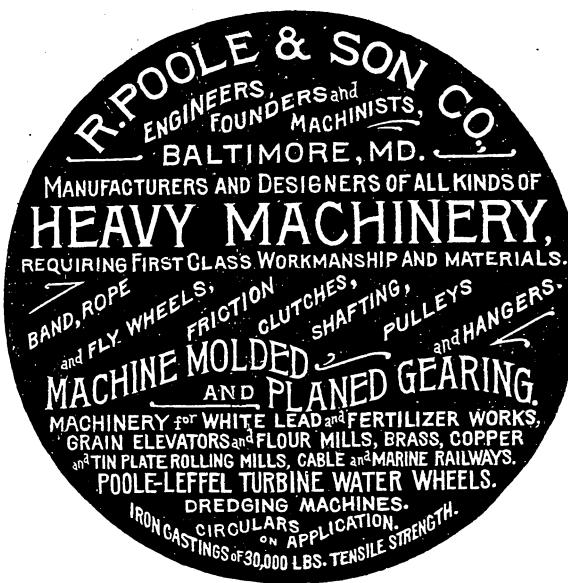


is a straight corrugated copper tube heater,  
and is making a record which its com-  
petitors find hard to beat. Send for the  
whole story to

THE TAUNTON LOCOMOTIVE MFG. CO.

TAUNTON, MASS.

Awarded the Grand Prize at Late Paris Exposition.



## RAND DRILL COMPANY.

We were Awarded the Highest Premium at the WORLD'S COLUMBIAN EXPOSITION on the following :

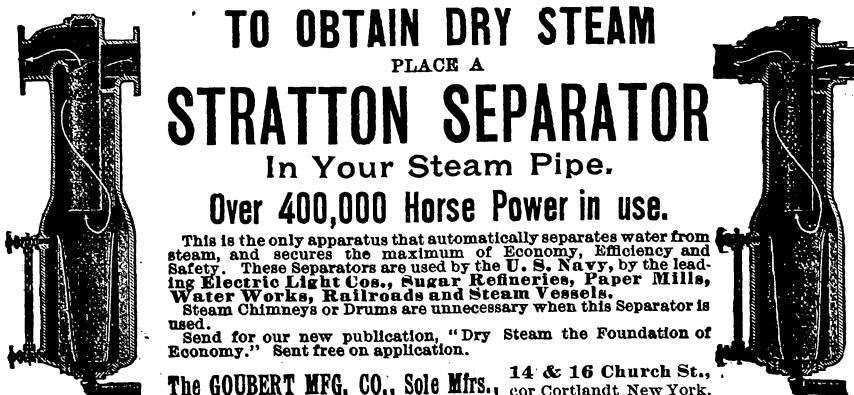
### DUPLEX COMPOUND STEAM AND COMPOUND AIR COMPRESSOR, AT MACHINERY HALL,

And the following, exhibited at Mines and Mining Building :

High Pressure Compressor,	Straight Line Compressor,
Little Giant Rock Drill,	Slammer Rock Drill,
Furnace Tapping Drill,	Shaft Bar,
Column,	Derby Bit, and
Award on Collective Exhibit of Compressors and Drills.	

RAND DRILL CO.,

23 Park Place, N. Y.



## GOODWIN'S

### Improved Book-keeping AND Business Manual

By J. H. GOODWIN.

Sixteenth edition; Forty-first Thousand; Four Thousand Testimonials; Richly bound in cloth, price, \$3.00

"Am following your directions and have lessened my labor one-half. I admire your system in every respect."—JAMES H. LOVELESS, bookkeeper for C. C. McCarthy, wholesale boots and shoes, Columbus, Ohio.

"After a few days' study of your valuable work I changed my books from Single Entry (as they had been kept for 10 years) to your system of Double Entry, and am greatly pleased with it."—W. T. CHANDLER, general merchandise, Ash Grove, Mo.

"'Tis the most complete work I have seen. I strongly recommend it to the accountant, or to anybody who is desirous of mastering the art of bookkeeping. I would not part with the copy now in my possession for \$500, if I did not know where I could procure another copy of the same work."—N. TOMNEY, bookkeeper for Graham, Horn & Co., Vermillion Bay, Ontario, Canada.

"I knew nothing about Double Entry Bookkeeping before I purchased your book, and had had no office experience. By following the instructions in your book I have been able not only to keep my books, but also to make all my Trial Balances, Balance Sheets, Partnership Statements, etc."—J. A. DALRYMPLE, of J. A. Dalrymple & Co., Haverhill, Mass.

"Am especially interested in the article on 'Air Houses (wholesale)', and consider it the perfection of elaboration and detail. Even after an experience of nearly thirty-one years with this firm as manager, I find a great deal of valuable information in this article. The price of your book is a mere song when compared with its great value in material."—CHARLES E. BRADY, manager of entry rooms and private accountant for E. S. Jaffray & Co., importers of dry goods, New York City.

"I find that your book contains many important points never brought out before in a work of its kind. I consider it invaluable to the fraternity of bookkeepers in general, and in particular to those who are connected with the offices of large mercantile houses."—W. H. RUSSELL, head bookkeeper for The H. B. Claffin Company, importers and jobbers of dry goods, New York City.

"Your book far surpasses my expectations, containing, as it does, so much valuable information."—CHAS. W. SIMMONS, with the Standard Oil Company, Cleveland, Ohio.

"Through the adoption of your system I have effected a saving in my work of at least one-third."—A. B. MUNN, bookkeeper for Miller, Coleman & Co., planing mill and lumber, Scranton, Pa.

Sent, post-paid, on receipt of price by

DAVID WILLIAMS,

Publisher and Bookseller,

96-102 Reade St., New York.

# The C. & C. ELECTRIC COMPANY

ARE PREPARED TO FURNISH

## MULIPOLAR DYNAMOS, DIRECT DRIVEN OR BELTED,

IN SIZES UP TO 250 H.-P.

Bipolar Dynamos up to 100 H.-P. Electric Motors, Automatic or Hand Controlled.

Complete Plants for Power Transmission. Isolated Lighting Plants.

Central Station Apparatus.

General Office, 143 Liberty St., New York. Works, Garwood, N. J., on Central R. R. of N. J.

BRANCH OFFICES: CHICAGO, 201 Madison Street. BOSTON, 63 Oliver Street. CLEVELAND, Cuyahoga Building. PHILADELPHIA, 633 Arch Street.

# NICKEL PLATING OUTFITS.

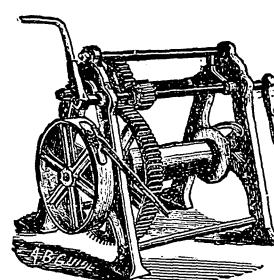
SEND FOR CATALOGUE OF NICKEL & ELECTRO-PLATING SUPPLIES & POLISHING MATERIALS.

ZUCKER & LEVETT CHEMICAL CO.

8 TO 14 GRAND STREET, NEW YORK, U. S. A.

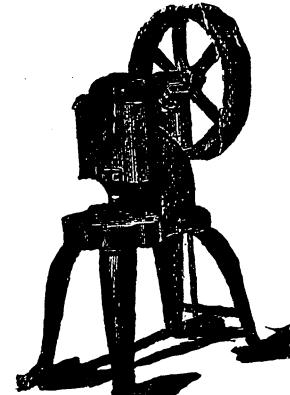
BUSINESS ESTABLISHED 1798. INCORPORATED 1801.

JOS. F. MCCOY CO.,  
26 Warren St., New York,  
HEADQUARTERS FOR



Tangye's  
Hydraulic  
Jacks.

SIZES:  
4 tons to 200 tons. Lifts  
on foot or top.



A. H. MERRIDEN, CONN.  
Manufacturer of all Descriptions of  
PRESSSES.

ESTABLISHED 1820.

The Hanson & Van Winkle Co., INCORPORATED 1891

MANUFACTURERS OF

## NICKEL AND ELECTRO PLATERS' MATERIAL.

Nickel-Plating Outfits  
From \$20 upward.  
DYNAMO-ELECTRO MACHINES  
For all purposes.

The New H. & V. W. Dynamo Machine.  
In sizes from No. 1 to No. 5.

FROM \$100 TO \$500.  
These machines will be placed on 30 days' trial with responsible parties, and if not satisfactory may be returned at our expense. Guaranteed 30% more powerful than any machine in the market at same price.

210-221 Market St., Newark, N. J.  
81 Liberty St., New York.  
35-37 South Canal St., Chicago, Ill.

WE FURNISH EVERYTHING.

Operated entirely by one handle.

**BUFFALO AUTOMATIC INJECTOR**

A GRADING INJECTOR.

Construction and operation is such that water supply is always in proportion to supply of steam admitted and can be graded to feed continuously with steam from 20 to 140 pounds. Works perfectly whether lifting or taking supply from city pressure. Operated entirely by one handle, both in stopping and starting and grading supply of steam and water.

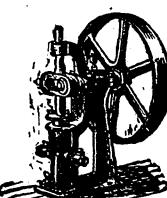
WASTE  
EAGLE EJECTORS, DUPLEX FLUE SCRAPERS, FELTHOUSEN GAUGE COCKS, IMPROVED GLASS OIL CUPS AND LUBRICATORS, CYLINDER OIL PUMPS, COMPRESSION GREASE CUPS, Etc. Send for Catalogue. Mention this Paper.

SHERWOOD MFG. CO., Buffalo, N. Y.

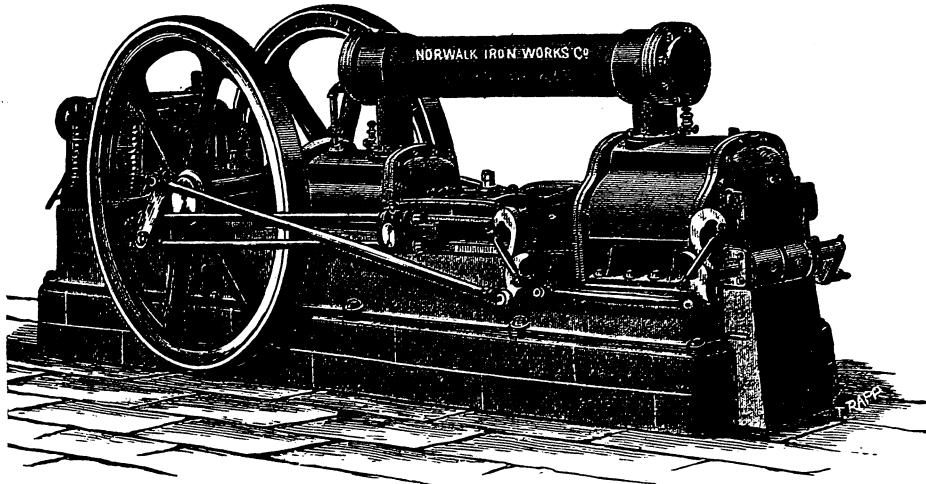
EUROPEAN AGENTS, Green & Boulding, 21 Featherstone St., London, E. C.

in 9 sizes, for from 2 to 100 H.-P. Boilers. The large sizes are geared, all self-contained, very strong built with large bearings and are both durable and reliable. They handle hot water from heater. Special heavy brass valves. Send for catalogue and prices.

**C. O. LUCAS & CO.,** 38 E. Front St. Greenville, Ohio.



# Air Compressors.



THE NORWALK IRON WORKS CO., South Norwalk, Conn.

**DEAN BROTHERS'**  
**Steam Pump Works,**  
INDIANAPOLIS, IND.

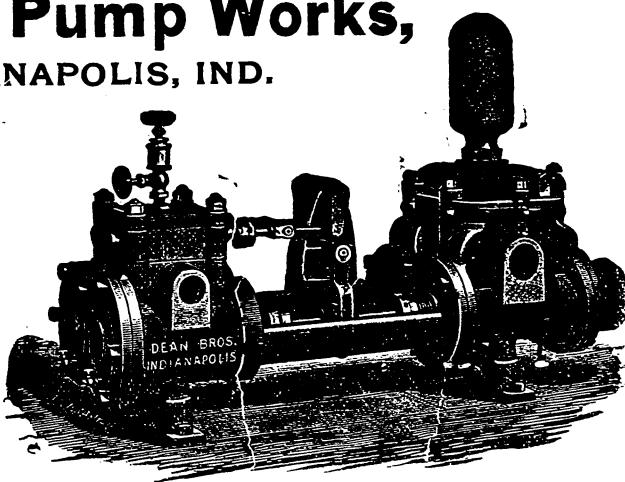
DUPLEX PUMPS.

SINGLE PUMPS.

DEEP WELL

PUMPS.

Send for Catalogue  
and Prices.



CHEAPEST.  
HANDIEST.  
SIMPLEST. { PUMPS.



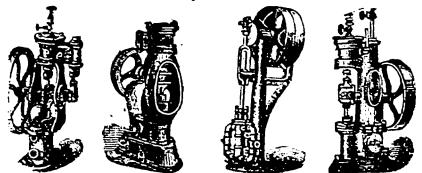
Handling Dirty, Gritty and Sandy Liquids,  
without Wear, Oil or Care. Pumping outfit  
for Contractors, Mining, Irrigating, Railroad,  
Quarry, Drainage and Manufacturing purposes.  
Second-hand Engines, Boilers, Pumps, and  
other Machinery always on hand. Exchanging.

**MASLINS, 165-167 First St., Jersey City, N.J.**

Send  
for  
Prices.



**VALLEY PUMP CO.**  
Easthampton, Mass.



The Metal Worker's Handy-Book  
OF RECEIPTS AND PROCESSES,

BEING A COLLECTION OF CHEMICAL FORMULAS AND PRACTICAL MANIPULATIONS FOR THE WORKING OF ALL THE METALS AND ALLOYS, INCLUDING THE DECORATION AND BEAUTIFYING OF ARTICLES MANUFACTURED THEREFROM, AS WELL AS THEIR PRESERVATION.

Edited from Various Sources by  
**WILLIAM T. BRANNT.**  
500 Pages, Cloth, \$2.50.

THE TECHNO-CHEMICAL RECEIPT BOOK.

CONTAINING

SEVERAL THOUSAND RECEIPTS, COVERING THE LATEST MOST IMPORTANT AND MOST USEFUL DISCOVERIES IN CHEMICAL TECHNOLOGY, AND THEIR PRACTICAL APPLICATION IN THE ARTS AND THE INDUSTRIES.

Edited from the German with Additions by  
**WILLIAM T. BRANNT.**  
495 Pages, Cloth, \$2.00.

Sent post-paid on receipt of price, by

**DAVID WILLIAMS, Publisher & Bookseller,**  
96-102 Reade St., New York.



**Worthington Steam Pumps**  
**CONDENSERS and WATER METERS.**

**HENRY R. WORTHINGTON,**

86 & 88 LIBERTY STREET, NEW YORK.

**BOSTON,**

**PHILADELPHIA,**  
ST. LOUIS,

**DENVER.**

**CHICAGO,**

**The WATERBURY-FARREL FOUNDRY & MACHINE CO., Waterbury, Connecticut,**

Builders of Rolling Mill Machinery, Special Machines for finishing and making goods from Sheet Brass, Copper, Steel, Silver, &c., **POWER PRESSES, HYDRAULIC PRESSES,** Drop Presses, Foot Presses, **RIVET MACHINES,** Gang Slitters, Grinding Machines, Steel Rolls, Wire Mill Machinery, Tube Drawing Machinery, Dies, &c.

# The Brown Hoisting and Conveying Machine Co.,

CLEVELAND, OHIO, U. S. A.,

Sole manufacturers of the

## "BROWN HOIST"

A NEW AND COMPLETE SYSTEM FOR HANDLING OF MATERIALS.

The Brown Patent Cable Tramway system.

The Brown Patent Suspended Beam Tramway system.

The Brown Patent Bridge Tramway system.

The Brown Patent Shed Tramway system.

The Brown Patent Furnace Stock Distributer.

The Brown Patent Warehouse Tramway system.

The Brown Patent Sewer Machine Tramway system.

The Brown Patent Continuous Elevated Tramway system.

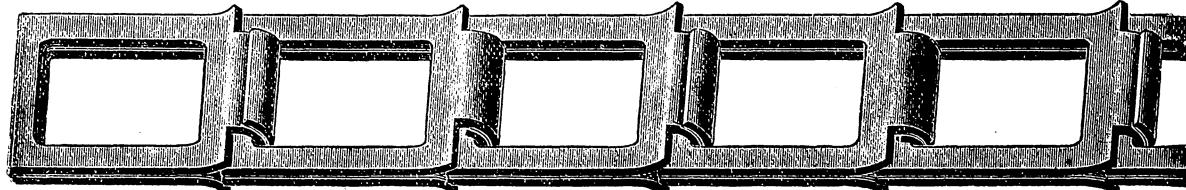
The Fayette-Brown Patent Automatic Furnace Hoist.

### The Brown Patent Friction Clutch Hoisting Engine.

Self-Dumping Buckets, Skip Cars, Friction Clutches, etc.

The Most Perfect Clutch.

**ROBERTS MFG. CO. - - - PITTSBURGH, PA.**



### PATENT DETACHABLE STEEL LINK BELTING,

Sprocket Wheels and Shafting.

Send for Catalogue and Price-List.

### ALEXANDER BROS. BEST OAK BELTING.

PHILADELPHIA.

Patterson, Gottfried & Hunter, Limited, agents,  
146-150 Centre St., New York, N. Y.

### JEFFREY CHAIN BELTING.

Also MALLEABLE, WROUGHT, STEEL AND SPECIAL CHAINS for

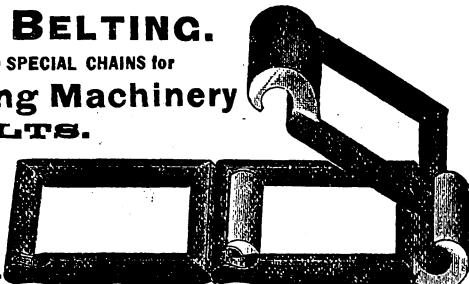
### Elevating and Conveying Machinery DRIVE BELTS.

Send for Illustrated Catalogue and Reduced  
Price-List.

### THE JEFFREY MANUFACTURING CO.

COLUMBUS, OHIO, U. S. A.

New York Branch, 163 Washington St.



### DURANT COUNTING MACHINES

Received the Highest Award at the  
World's Columbian Exposition.



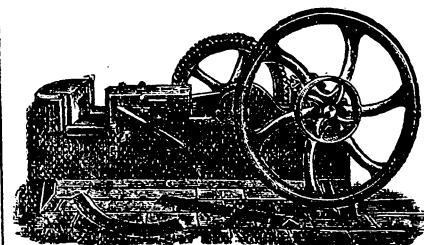
Send for  
Catalogue  
to

W. N. DURANT, 234 22d St., Milwaukee, Wis.

### PITTSBURGH MFG. CO.,

Manufacturers of

Crosgrove's Patent Straightening, Bending and Punching Machines.



### NAIL MACHINERY.

Bolts, Nuts, Rivets, Castings, &c.

PITTSBURGH - - PA.

### FOR THE "Double Triple Quick Stroke" SHAPER

WRITE TO  
GOULD & EBERHARDT, Newark, N. J.



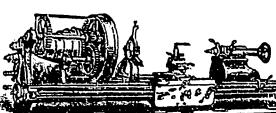
12 in., 16 in., 20 in., 24 in., 28 in., 30 in. stroke.

### FITCHBURG MACHINE WORKS,

MANUFACTURERS OF THE CELEBRATED

### FITCHBURG

AND OTHER



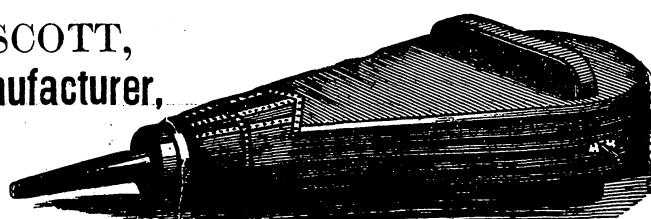
### ENGINE LATHE

METAL-WORKING MACHINES,

FITCHBURG,  
MASS.

### GEO. M. SCOTT, Bellows Manufacturer,

Johnson Street,  
Cor. 22d St.,  
CHICAGO, ILL.



HOUSE ESTABLISHED 1827.

OLDEST AND LARGEST OF THE KIND IN THE WORLD.

Miners, Importers and Manufacturers of

**GRAPHITE, PLUMBAGO, BLACK LEAD,**  
FOR ALL PURPOSES.**DIXON'S  
PLUMBAGO  
FACINGS**

CALLED

**India Silver Lead.**

FOR SAMPLES AND PRICES ADDRESS

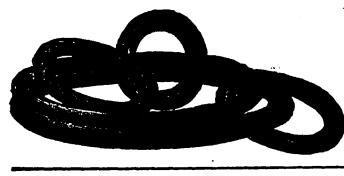
**JOS. DIXON CRUCIBLE CO.,**  
JERSEY CITY, N. J.**H. O. CANFIELD,**

MOULDED BRIDGEPORT, CONN.

RUBBER GOODS

Small moulded work a specialty. Send for estimates for moulds and work.

FOR MECHANICAL PURPOSES.

**JOHN ADT & SON,**

New Haven, Conn.

BUILDERS of MACHINERY for HARDWARE MANUFACTURE.

BUTT MILLING MACHINERY,

BUTT DRILLING MACHINERY,

RIVETING MACHINES,

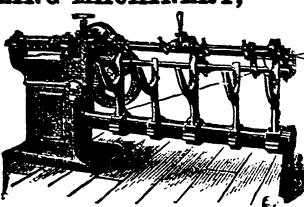
WIRE STRAIGHTENING

MACHINERY,

FOOT PRESSES,

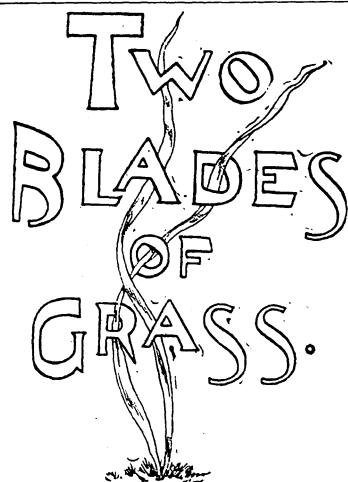
SPRUE CUTTERS,

ETC.



Automatic Wire Straightening and Cutting Machine.

Elastic Rotary-Blow Blowing Machine.



THIS IS THE TITLE of a little booklet we have just issued ON OUR GARDEN HOSE. The booklet in some features is new. The hose of which it treats is also new in some features, though old and tried in reputation. We offer this year:

**RUBBER HOSE—(Three Grades).**

CARBON, - - - - - Good.

DOUBLE DIAMOND, - - - - - Better.

1846-PARA, - - - - - Best.

**COTTON HOSE—(Two Grades).**

SPIDER, - - - - - Good.

DOUBLE DIAMOND, - - - - - Best.

Send for one. Learn the moral and be numbered among the public benefactors who make "Two Blades of Grass grow where there was one before."

**NEW YORK BELTING & PACKING CO. LTD**

PIONEERS AND LEADERS,

15 PARK ROW, NEW YORK.

**LEVIATHAN BELTING.**

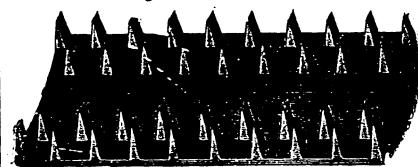
Positively unequalled for Strength, Durability and Traction Power; unaffected by Heat, Steam or Water.

Belts for Main Driving and work of a heavy nature a specialty.

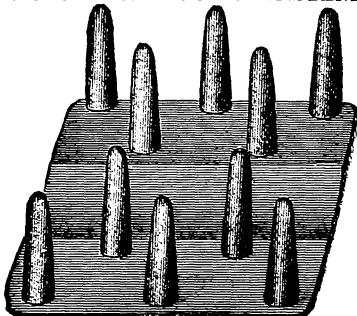
**MAIN BELTING COMPANY,**  
Sole Manufacturers,  
1219-1235 Carpenter St.,  
PHILADELPHIA.248 Randolph Street, Chicago.  
120 Pearl Street, Boston.

Send for Price-Lists and Samples.

Talcott's Original Wilson Belt Hooks.

**W. O. TALCOTT**, Providence, R. I.  
MANUFACTURER OF  
Four Styles of BELT HOOKS, Including 134 Sizes.  
SEND FOR CATALOGUE.

Thacher's Patent BELT FASTENERS

Manufactured by  
The Clasen Manufacturing Co., Cleveland, O.  
Office, 71 and 73 Ontario St.

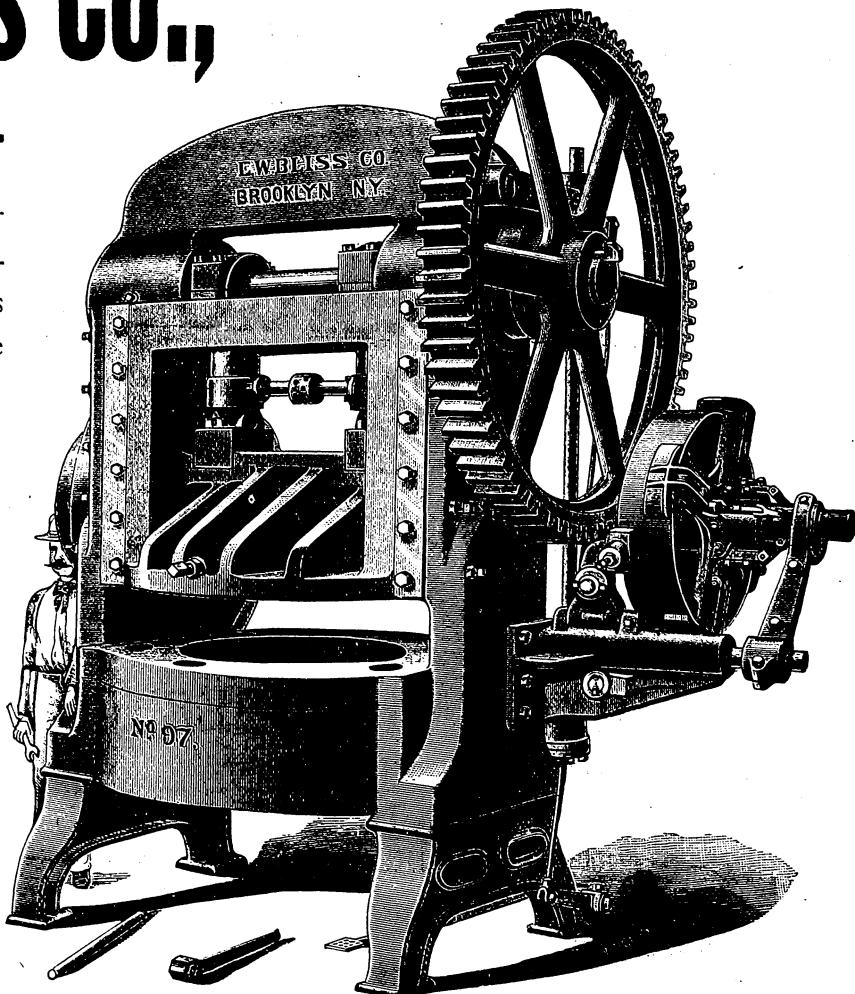
# E. W. BLISS CO.,

11 ADAMS ST., BROOKLYN, N. Y.

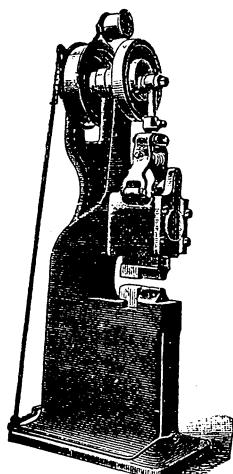
These presses are intended for operating large and accurate cutting and perforating dies, such as armature rings, etc. They are made in a number of sizes.

**PRESSES,  
PUNCHES,  
SHEARS,  
DROP  
HAMMERS,  
DIES  
AND  
SPECIAL  
MACHINERY.**

The Stiles & Parker Press Co.



## The Dupont Power Hammer STANDS FIRST



The Dupont Power Hammer.

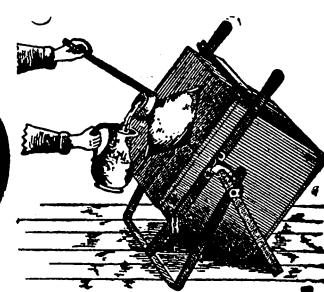
**I N** { Simplicity of Adjustment,  
Simplicity of Construction,  
Economy of Power,  
Economy of Space,  
Durability,

And costs less than any hammer built. Send for our new descriptive circular to

**The Dupont Manufacturing Co.,  
ST. JOHNSBURY, VT.**

**A. L. HENDERER,**  
Wilmington, Del.  
MANUFACTURER OF  
Hydraulic Jacks, Hydraulic  
Punches, Screw Punches,  
Steel Tube Expand-  
ers, Flue Hole Cut-  
ters, Boiler Test  
Pumps and Pipe  
Vises.

**STAR LOCK WORKS, PHILA.**  
**W. & L. WOLF,**  
MANUF'RS OF  
1ST QUALITY ONLY  
SCANDINAVIAN  
AND  
Spring Padlocks,  
Trunk & Case Locks,  
Carboy Stands, &c.  
Catalogues Sent on Application.



**RIEHLE**

**BROS. TESTING MACHINE CO., Phila.,** have issued a new  
describing and illustrating all the various styles of their U. S. Standard Testing Ma-  
chinery with the special appliances. Marble Machinery, Rope Twisters, Loam Mills,  
Riehle-Robie Frictionless Ball Screw Jacks, Iron and Wooden Trucks, &c., &c., are  
described. It is desired to have one of these Catalogues in the office of every Super-  
intendent, Purchasing Agent, Engineer or Manufacturer using such Machinery. A  
copy will be mailed free of charge to those who may apply.

**CAT. No. 3**

# Ferracute Machine Co.

BRIDGETON, N. J., U. S. A.,

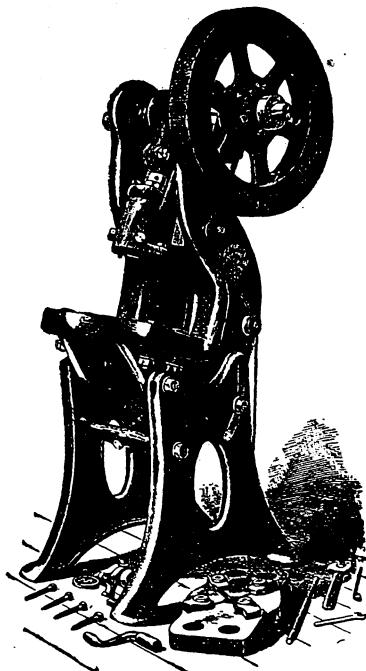
MANUFACTURERS OF

FOOT AND POWER

## PRESSES, DIES,

AND ALL OTHER

Tools for Bar and Sheet Metals.



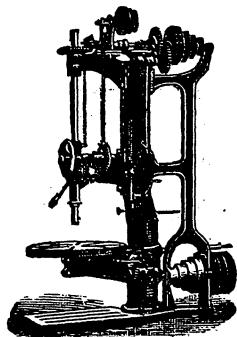
Send for Illustrated Catalogue containing sizes, weights and prices of one hundred kinds of Presses and other Tools for Brass Goods, Locks, Hardware, Nuts, Washers, Drop Forgings, Railroad, Bridge and other General Machine Shop Work, &c. Also for Tinware, Cans, Boxes, Lamps, Gas Fixtures and Silverware, &c., &c.

### NEW HAVEN MANUF'C CO.

New Haven, Conn

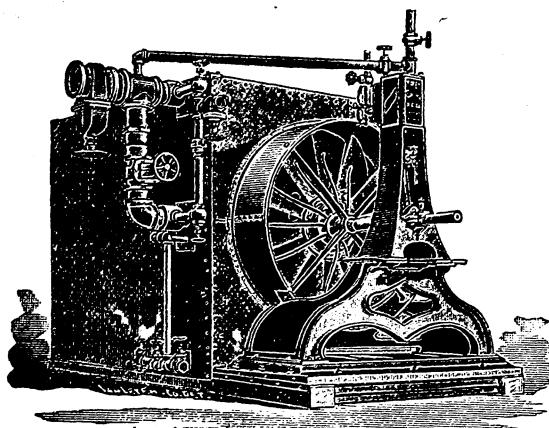
Manufacturers of

Lathes,  
Planers,  
Shapers,  
Slotters,  
Etc.



Handy Tables from Thurston's Steam Engine Manual. By Prof. R. H. THURSTON. For use in Laboratory Computations in Technical Schools. 8vo, cloth.....\$1.50

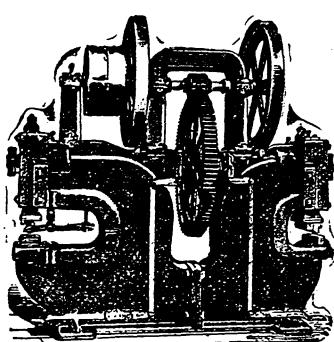
For sale by David Williams, 96-102 Reade St., N. Y.



Boston,  
Chicago,  
New York.

HUYETT & SMITH MFG. CO., DETROIT, MICH.

For Heating  
Schools,  
Churches,  
Factories,  
Stores,  
Machine and  
Railroad Shops.



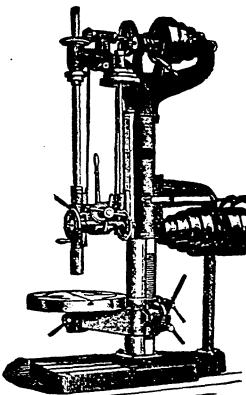
## PUNCHES & SHEARS

Double, Single, Multiple, Horizontal, Belt and Steam driven. Bending and Straightening Rolls, Spacing Tables, Doublers for Sheet and Tin mills. Sheet Metal Working Machinery of every description. Send for complete catalogue.

The Wais & Roos Punch and Shear Co.

456-460 Plum St., Cincinnati, O.

## THE Tool Room

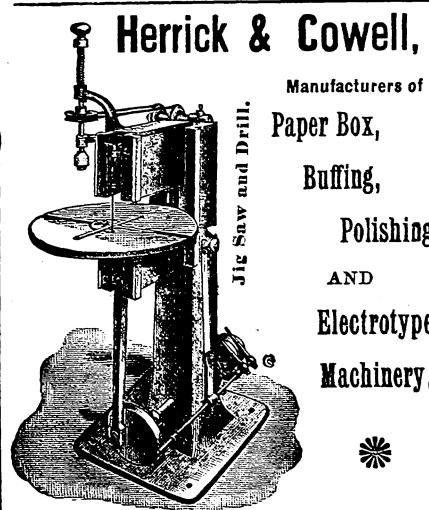


Or Machine Shop without proper machinery for keeping old tools in repair and the making of new ones cannot hope to succeed. The Hamilton Drill Press is a necessary adjunct to all such, because it does all that a tool of this kind can do, and besides, it's built on honor.

### THE HAMILTON MACHINE TOOL COMPANY

WEST MARKET STREET,

Hamilton, - Ohio, U. S. A.



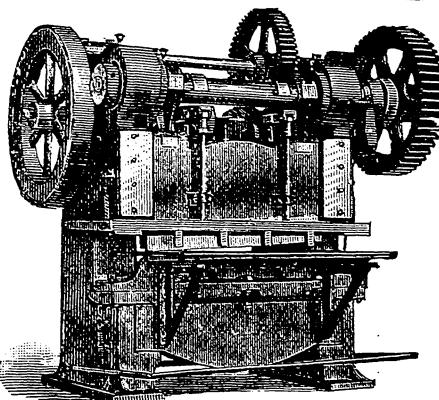
NEW HAVEN, - CONN.  
SEND FOR CATALOGUE.

### WE LEAD.

Sweetland Combination Chucks. Simple, accurate, original. Standard Independent Chucks, Solid Steel, Solid Reversible Jaws.



The Hoggson & Pettis Mfg. Co.,  
New Haven, Ct.



GATE SHEAR.  
THE LONG & ALLSTATTER CO.,  
HAMILTON, OHIO, U. S. A.

MANUFACTURERS OF  
Belt, Steam and Electrically Driven  
Power Punches and Shears.

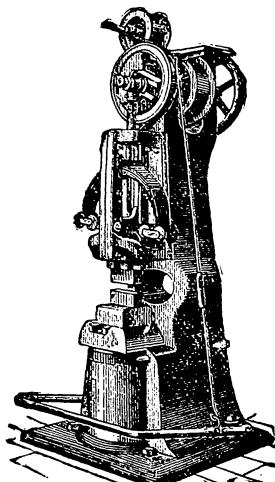


J. Popping's  
Patent Machine  
and Tool Wks.

MANUFACTURERS OF  
Solid Iron Shoulder Rabbet Planes, etc., etc., and  
Hofstatter's Patent Hair Picking Machine.  
N. E. Cor. 58th St. and 11th Ave., N. Y.

# If You Use Power Hammers

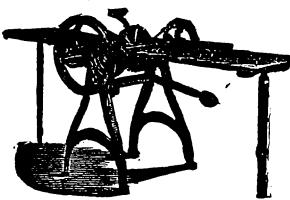
Write to us for Circulars.  
**SCRANTON & CO.,**  
NEW HAVEN, CONN.



Chicago Office, 65 South Canal Street.

## BARNES

Hand and Foot Power Machinery,  
FOR CARPENTERS AND BUILDERS.

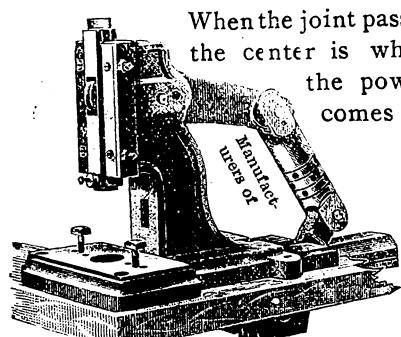


Discounts to the trade on application. Send for Catalogue and Price-List.

**W. F. & JOHN BARNES CO.,**  
69 Ruby Street, ROCKFORD, ILL.  
ENGLISH AGENTS, CHAS. CHURCHILL & CO.,  
21 Cross Street, Finsbury, E. C., London

**Cross & Speirs Machine Co.,**

When the joint passes  
the center is when  
the power  
comes in.



POWER  
FOOT  
DROP

Automatic ma-  
bending wire.  
Automatic ma-  
working sheet



81 TO 37 CANAL STREET,  
WATERBURY, CONN.

**Handbook of Ornament.** By FRANZ SALES MEYER.  
A grammar of art industrial and architectural, de-  
signing in all its branches, for practical as well as  
theoretical use. Authorized English edition. 580  
pages, illustrated, cloth..... \$3.00

For Sale by David Williams, 96-102 Reade St., N. Y.

# LINK-BELT

ENGINEERING CO.  
NICETOWN,  
PHILA.  
49 DEY ST.  
NEW YORK

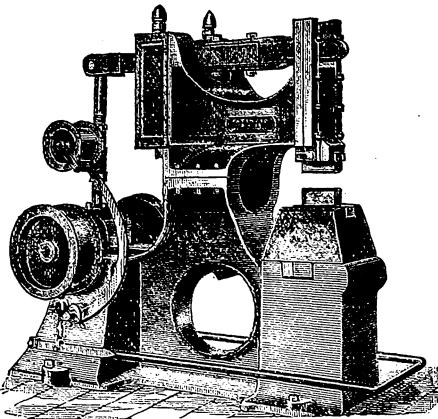
Elevators, Conveyors, Manila Rope Power Transmission Machinery, Ewart Detachable Link Belting, Dodge Chain, Howe Chain, &c.

General Eastern Agents for Fibre-Graphite Journal Bearings for shafting and machines. Require no oil or other lubricant. Moderate in price, durable and guaranteed. Bearings furnished to fit hangers now in use.

WESTERN CONNECTION

[CHICAGO,] **LINK BELT MACHINERY CO.**

## JENKINS' POWER HAMMERS.



Adjustable and elastic stroke,  
nicety of regulation, efficiency of  
action, simplicity and durability of  
construction and the absence of  
leather straps, steel springs and all  
complication, combine to make this  
hammer the favorite wherever used.

**JENKINS & LINGLE,**  
BELLEFONTE, PA.

Presses of all kinds for

## SHEET METAL WARE.

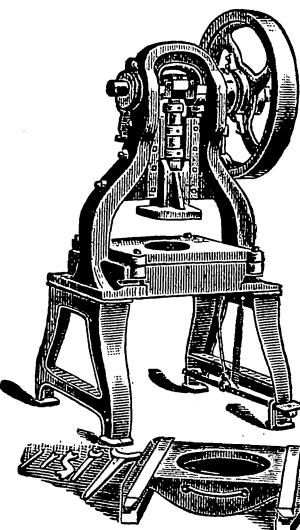
Wiring, Blanking and Combination  
Dies a Specialty.

Just out. Special new machinery  
FOR MAKING ROUND, SQUARE AND

## CORRUGATED CONDUCTOR PIPE

In 10 Feet Lengths.

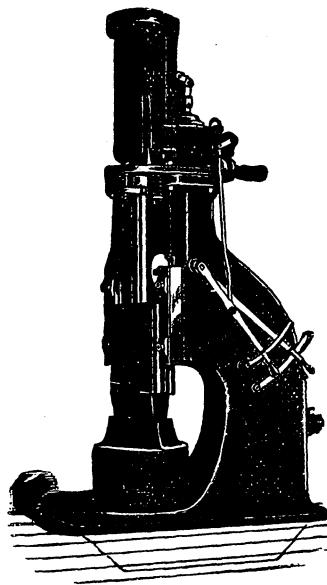
WILL TURN OUT 10,000 FEET PER DAY.



**Stark Machine & Tool Co.,**  
BUFFALO, N. Y.

**G. A. CROS**  
Manufacture  
**PRESSE**  
FOR AND  
SPECIAL MA  
SHEET METAL  
176-178 So. Clinton

**BY**  
rs of  
S. DIES  
CHINERY  
WORKERS  
Sr., Chicago, Ill.



**Bement, Miles & Co.,**  
PHILADELPHIA, PA.,  
Builders of  
**Metal-Working  
Machine Tools**

For railroad shops, locomotive and car builders, machine shops, steam forges, shipyards, boiler shops, bridge works

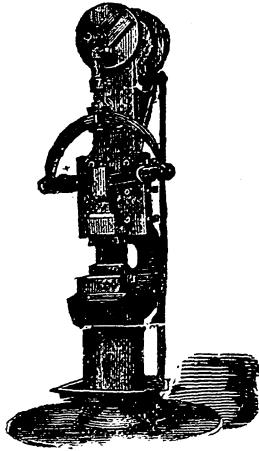
**Steam Hammers for Working Iron or Steel.**

NEW YORK OFFICE. Equitable Building.

GEORGE PLACE, Agent.

**DEAD-STROKE POWER HAMMERS.**

CONSTRUCTION IMPROVED.  
Prices Reduced to 250 Pounds.  
Seven Sizes.



The 15 and 25 pound sizes are specially adapted to filemakers' use, the other sizes for general forging. Send for circular and references.

**DIENELT & EISENHARDT,  
MAKERS,  
1310 Howard St., Philadelphia.**

**THE STURTEVANT  
STEEL PRESSURE BLOWERS**

For Cupola Furnaces and Forges.

THE STURTEVANT SYSTEM

—OF—

**Heating and Ventilating**

MANUFACTURING ESTABLISHMENTS.

**PORTABLE FORGES**

SEND FOR CATALOGUES.

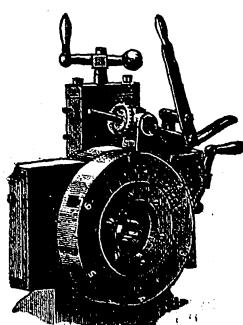


**B. F. STURTEVANT CO.,**

BOSTON, MASS.

BRANCHES: 91 Liberty St., New York. 16 So. Canal St., Chicago. 135 No. Third St., Philadelphia

IF YOU WANT ANYTHING IN THE LINE OF  
**DROP PRESSES • DROP HAMMERS •  
STAMPS OR AUTOMATIC  
DROP LIFTERS**  
SEND FOR CATALOGUE TO  
*Miner & Peck Mfg. Co.*  
LARGEST LINE IN THE MARKET  
New Haven, Conn.



Engravings Show the Style of Die  
Head which the

**Bignal & Keeler Mfg. Co.,**

ST. LOUIS, MO.,

PLACE ON THEIR

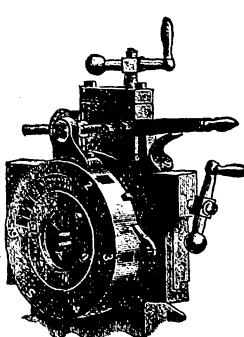
PEERLESS AND DUPLEX

Pipe Threading & Cutting Machines.

Write for Prices on the

Most Perfect and Economical Line  
of Machines on the Market.

Mention The Iron Age.

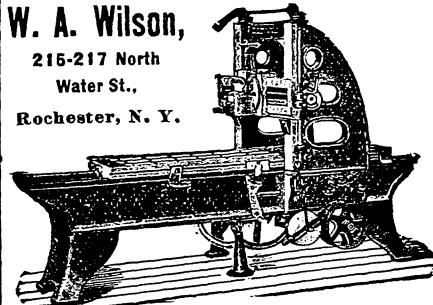


"Peerless" Head showing  
dies closed.

"Peerless" Head showing  
dies expanded.

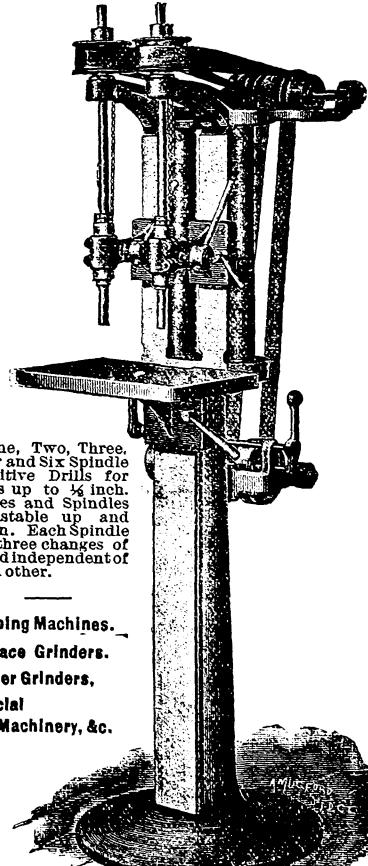
**W. A. Wilson,**

215-217 North  
Water St.,  
Rochester, N. Y.



Improved Iron Planers a specialty. 20 x 20, 22 x 22, 24 x 24 up to 42 x 42, to plane any length. Send for description and price-list before purchasing. Manufacturers' agent for other tools and machinery. Mention The Iron Age.

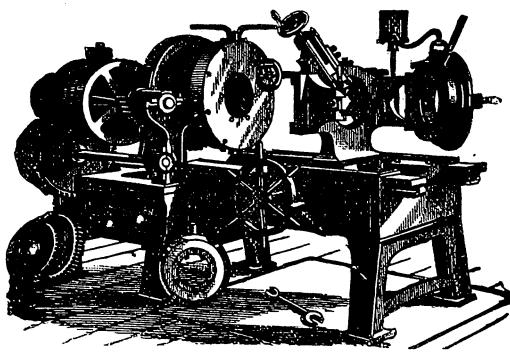
**Woodward & Rogers,**  
HARTFORD, CONN.



One, Two, Three,  
Four and Six Spindle  
Sensitive Drills for  
holes up to  $\frac{1}{8}$  inch.  
Tables and Spindles  
adjustable up and  
down. Each Spindle  
has three changes of  
speed independent of  
each other.

Tapping Machines.  
Surface Grinders.  
Cutter Grinders,  
Special  
Machinery, &c.

Why Band Saws Break. Sixteen reasons and  
how to avoid them. Being instructions to filers  
on the care of large band-saw blades used in  
the manufacture of lumber. By JOSHUA OLDHAM, 90 pages, illustrated, cloth.....\$1.00  
For Sale by David Williams, 96-102 Reade St., N.Y.



# D. SAUNDERS' SONS,

—MANUFACTURERS OF—

## Pipe Cutting and Threading Machines

For Pipe-Mill and Steam Fitters Use. Tapping Machines for Steam Fitting. Also Steam and Gas Fitters' Hand Tools.

—SEND FOR CIRCULARS.—

No. 25 Atherton Street, - YONKERS, N. Y.

The Merrill Manufacturing Co.,  
TOLEDO, O.

Manufacture  
The Best  
and Most  
Complete  
Line  
of  
Hand  
and  
Power

PIPE  
THREAD'G  
MACH'RY  
IN  
USE.

—SEND FOR CATALOGUE

QUINT'S TURRET DRILLS.  
Six Spindle.  
Drills from 1-32 to  $\frac{1}{2}$  hole. Speed  
from 250 to 2000 rev.  
Suitable for a large variety of  
work and is operated with ease  
and rapidity.

SEND FOR CIRCULAR.  
A. D. QUINT, Harford, Conn.

# HYDRAULIC JACKS.

All sizes. All styles. All warranted.

# HYDRAULIC PRESSES,

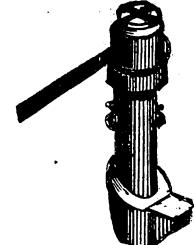
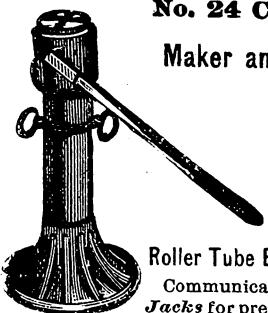
PUMPS, ACCUMULATORS, VALVES, GAUGES, FITTINGS, &c.  
WATSON & STILLMAN, - 204-210 E. 43d St., New York.

# RICHARD DUDGEON,

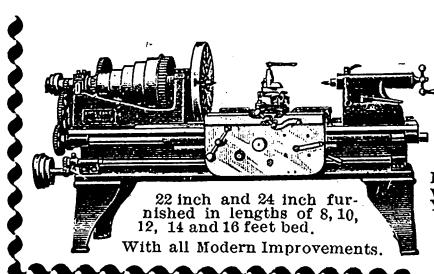
No. 24 Columbia Street, New York.

Maker and Pattee of the Improved

## Hydraulic Jacks AND Punches.



Roller Tube Expanders and Direct Acting Steam Hammers  
Communication by letter will receive prompt attention.  
Jacks for pressing on Car Wheels or Crank Pins made to order.

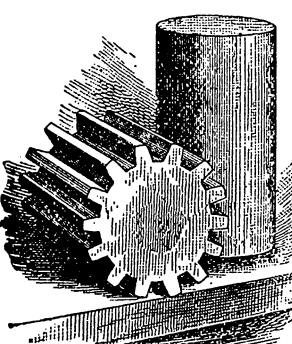


# Eng. Lathes.

When you want to do anything that requires  
Radial Drilling Machinery you want a tool that  
will save time, consequently money and labor.  
You do this with

Dietz, Schumacher & Co.,  
Cincinnati, Ohio, U. S. A.

Our Patent  
Radial Drills.



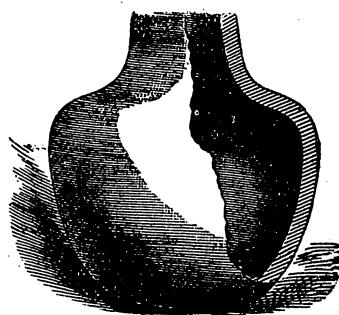
Billet and Patent Hot-Pressed  
Steel Pinion

Hot  
Pressed  
Pinions.

# Heavy Drawn Steel Work

Of Every Description.

Including Shapes for Centrifugals, Bottles for confining  
Gases, Chemicals, Quicksilver, etc., Heavy Tubing for  
Knitting Machines, Hydraulic Jacks and Presses, Air  
and Gas Receivers drawn from solid steel or plates,  
Straps, Wrists, Pins, Discs, Cups, Steel Flanges for high  
pressure steam, Drawn Seamless Steel Tubing for  
Bicycles, Boilers, including small diameter Tubing for  
use as hollow spindles, etc., etc.



Steel Bottles, any thickness or shape.

Hydraulic  
Forgings.

 UNITED STATES PROJECTILE CO.,

1st Ave. and 53rd St., Brooklyn, N. Y.

## THE FULL MOUNTED LIGHTNING

These plates have a stock with each die. The dies are our celebrated adjustable Lightning dies. Each stock is of correct length and weight to suit size of die. Several sizes of dies may be in use out of the same set at the same time. Send for catalogue.



Made by WILEY & RUSSELL MFG. CO., Greenfield, Mass., U. S. A. Send for new catalogue.

New York Agency for Wiley & Russell, 114 Liberty St.

# Don't Buy

### \*Maule's "Skeleton" Pipe Die

#### If You Wish to Avoid

A Pipe-Threading Die extremely easy of operation by reason of the proper clearance of its cutters;

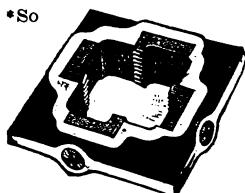
Of surpassing durability secured by the accurate and uniform temper of said Cutters;

Having Cutters that when dull may be removed in a moment, and sharpened on a grindstone or emery wheel;

Of phenomenal cheapness, arising from small first cost coupled to excellence of quality.

If by chance you do not think these points, or the saving of money, objectionable,

\*So



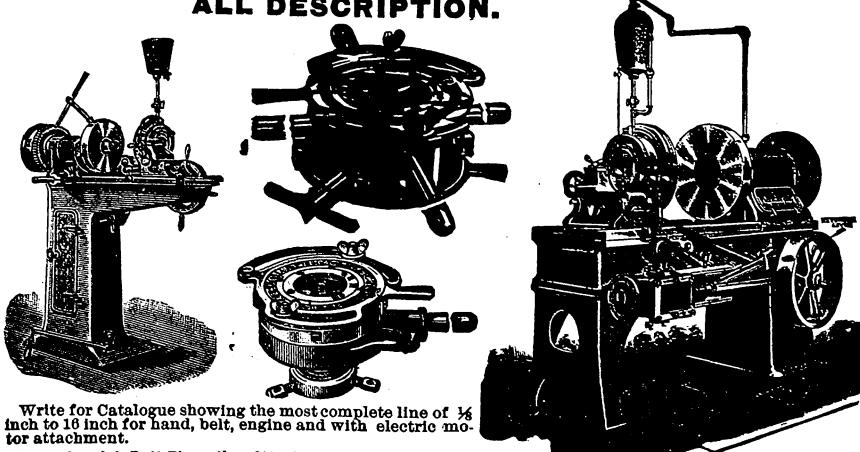
Send us a Postal Note for 62 Cents (do not send us postage stamps), and we will mail you a sample one-inch Die, either 2 3/8 or 2 1/2 x 3/4 thick, which we hereby agree to take back if not to your satisfaction.

HENRY B. PANCOAST & CO.,  
PHILADELPHIA, U. S. A.

Send for Catalogue of the "Skeleton" Pipe Die.

## JARECKI MFG. CO. (Limited), Erie, Pa.

PIPE THREADING AND CUTTING TOOLS OF ALL DESCRIPTION.

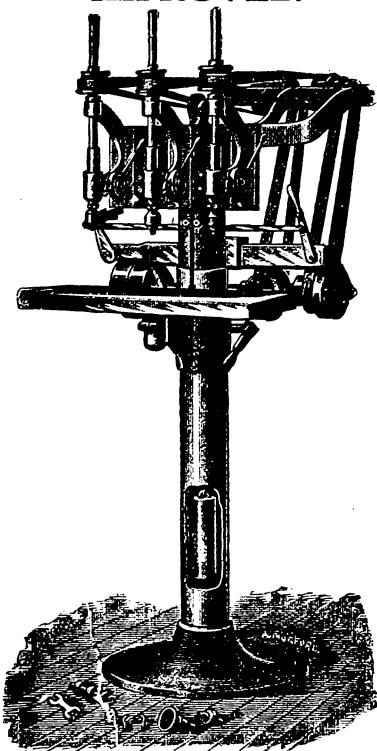


Write for Catalogue showing the most complete line of 1/8 inch to 16 inch for hand, belt, engine and with electric motor attachment.

We can furnish Bolt Threading Attachment for this Machine.

## SIGOURNEY DRILLS.

IMPROVED.



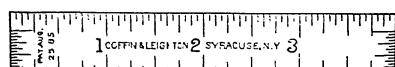
Sensitive, Strong and Interchangeable

One, Two and Three Spindles.

Counter-balanced Spindles and Tables. Vertical range of table, 30 inches, and it will swing to right or left.

SEND FOR CIRCULAR.

THE SIGOURNEY TOOL CO.,  
Hartford, Conn.



MACHINISTS' SCALES,  
PATENT END GRADUATION.

Liberal Discount to the Trade. Send for List.

COFFIN & LEIGHTON, Syracuse, N. Y.

LIGHT  
DRILL PRESSES  
MFRS. OF  
THE LARGEST  
VARIETY  
SEND FOR NEW  
30 PAGE CATALOGUE  
JUST OUT  
DWIGHT SLATE  
MACHINE CO.  
HARTFORD, CONN.



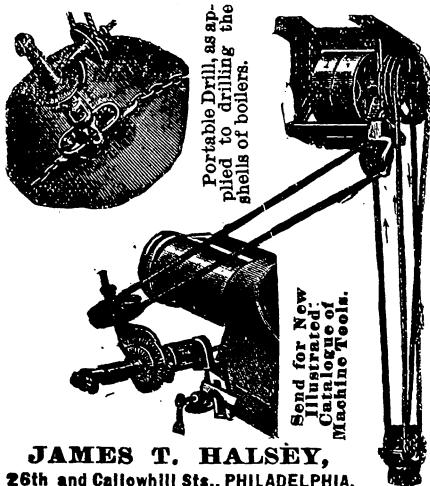
OUR ADJUSTABLE STOCKS and DIES are universally acknowledged to be the BEST! We also make all our Tools on the same principle of the Best Material and Workmanship, and always with a view of time and labor saving in their use.

## FRICITION CLUTCHES, SHAFTING, HANGERS, PULLEYS.

Sheaves for Rope Driving.  
Gear-Wheels.

### FRICITION PULLEYS.

**KEYSTONE**  
CLUTCH AND MACHINE WORKS,  
1708-1710 Germantown Ave.,  
PHILADELPHIA, PA.



## Portable Drilling and Tapping Machines.

ALBERT M. COLBURN,  
Wall St., New Haven, Conn.

Send for New No. 4 Catalogue.

### REECE'S PATENT HAND BOLT CUTTER OR SCREW PLATE.



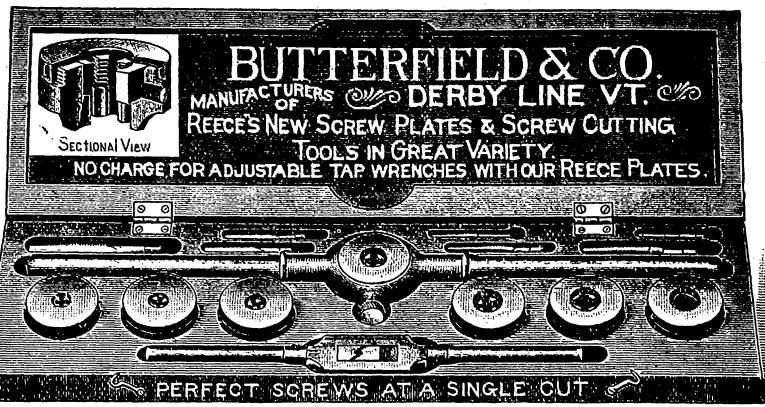
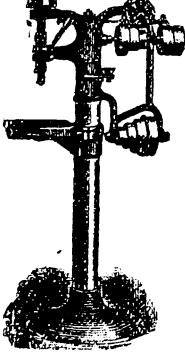
Send for new catalogue of  
**SCREW CUTTING TOOLS.**  
EDWARD F. REECE, Mnfr., GREENFIELD, MASS



## The Norton Drills

for light, sensitive and rapid drilling. 1, 2, 3, 4 or more spindles, sensitive or automatic feed. To drill from 0 to  $\frac{1}{2}$  inch diameter. The latest and best. Most convenient, sensitive and durable drills on the market. Have balanced spindles and balanced tables. Write for prices and description, or for special machinery.

THE  
NORTON & JONES MA-  
CHINE TOOL WORKS,  
PLAINVILLE, CONN.



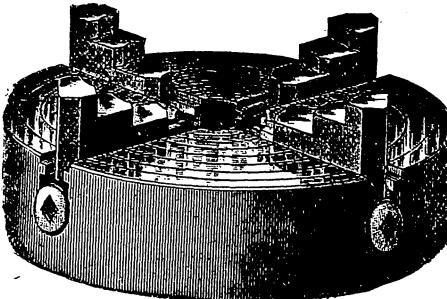
## CUSHMAN CHUCKS.

We have recently improved our full line of Geared Scroll Chucks and have also added a 10 $\frac{1}{2}$  inch and a 15 inch. Prices and discount on application.

Send for our catalogue of all kinds of Lathe and Drill Chucks.

**The Cushman Chuck Co.,**  
Hartford, Conn.

## CHAMPION INDEPENDENT CHUCKS.



An entirely new line of small Chucks, provided with 3 or 4 independent reversible steel jaws. The best Chuck in the market for foot lathes. Ask your dealer for them or write to us.

**THE D. E. WHITON MACHINE CO.**  
Solo European Agents SELIG SONNENTHAL & CO., London. New London, Conn.



Three styles of Screw Plates **BUILT EN-  
TIRELY ON HONOR**, with prices to suit all.  
Write for catalogue.

**CHAMPION BLOWER & FORGE CO.,** LANCASTER, PA.



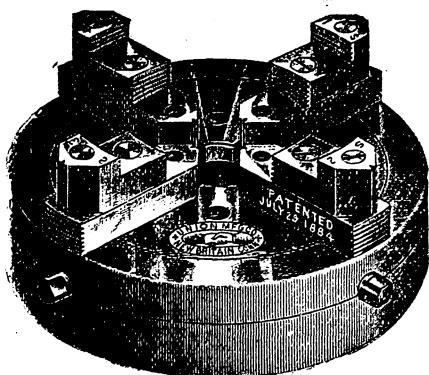
THE ADJUSTABLE  
**“DUPLEX” DIE STOCK.**  
Quick. Accurate. Durable.  
15,000 now in use.  
HART MANUFACTURING CO.,  
CLEVELAND, O., U. S. A.



# UNION MANUFACTURING COMPANY, . . . NEW BRITAIN, CONN.

WAREHOUSE, 103 CHAMBERS ST., NEW YORK.

Manufacturers of Combination Chucks, Universal Chucks, Independent Chucks, Combination Reversible Jaw Chucks, Car Wheel Chucks, &c., &c.



## Union Chuck No. 21.

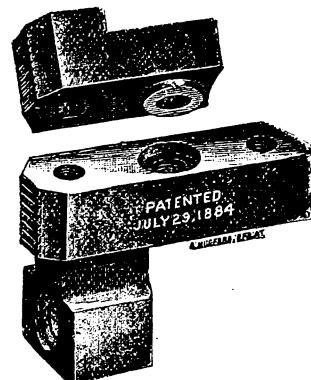
Combination with Reversible Jaws.

ALSO

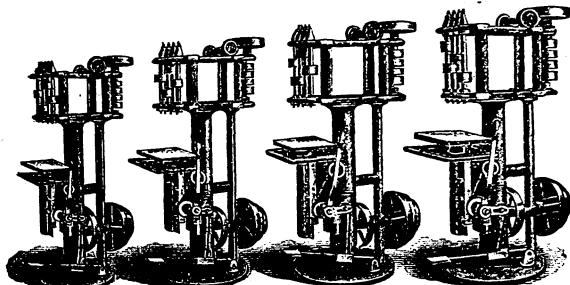
Showing Sectional Cut of Jaw.

We guarantee our Chucks in every particular.

WRITE FOR CATALOGUE AND PRICE-LIST.



# PRATT & WHITNEY CO., Hartford, Conn., U. S. A.



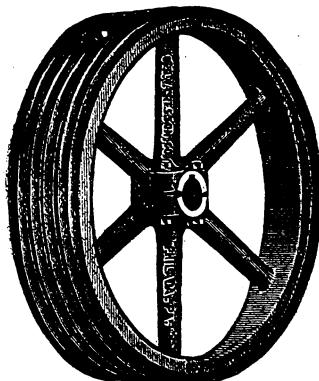
Manufacture Gang Drills of improved design, with two, three, four and six spindles, in four sizes. The spindles are made of tool steel, have steel boxes hardened and ground, with provision for adjustment for wear. Tables are counterbalanced.

Drilling Machines of many styles in Stock.

ASK FOR "HARDWARE" CATALOGUE.

# GEO. V. CRESSON CO.,

18th STREET AND ALLEGHENY AVE.  
PHILADELPHIA, PA.



# ROPE WHEELS,

All Diameters and Number of Grooves, for Manilla, Hemp, Cotton, or Leather Ropes.

Wire Drawing Machines, **WATERBURY**

Gang Slitters,

**MACHINE CO.,**

Power Presses and Dies, Waterbury, Conn.

Tumbling Barrels,

MANUFACTURERS.

Special Machinery.

Send For Prices.

# STAY BOLT TAPS.

THREAD REAMER TAPER STRAIGHT SHANK

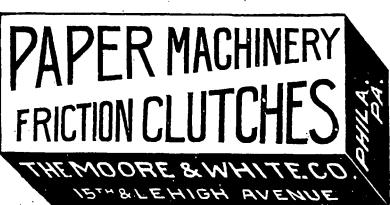
E \* D \* C \* B K A

We Make a Specialty of this Style of Tap.

# WELLS BROS. & CO.,

GREENFIELD,  
MASS., U. S. A.

CUT THIS OUT, mark  
Description of TAPS  
used and send to us  
for prices.



**Chucks** The National.  
All sizes and styles.  
Pat'd Reversible  
Jaws. Ill'd Catalogue. The Standard Chuck  
since 1882. Address W. WHITLOCK, 39 Cortlandt  
St., N. Y. Works, 1300 Hudson, St., Hoboken, N. J.

# WE MAKE

Cutting-off Machines embodying all the latest improvements and which prove themselves the best and most economical machines in the market. You cannot afford to use a poor machine in these hard times. Our Cone Driven Machine has two tools taking a shearing cut and doing double the work of any one tool machine ever made. The Accelerated Speed Machine has the same arrangement but in addition the speed is accelerated as the tools approach the center. These machines have proved in the shop that they will do double the work per day that even our Cone Driven Machine can. Perhaps you would like to know more about them. Just ask us, that's all.

HURLBUT-ROGERS MACHINE CO., South Sudbury, Mass.

# THE STANDARD TOOL CO., CLEVELAND, OHIO.

MANUFACTURERS OF

Increase Twist Drills, Reamers, Taps, Milling Cutters and Chucks.



Taper Shank  
Drills,  
St. Shank Drills,  
Screw-driver  
Bits,  
Reamers,  
Shell and Solid  
Taper Reamers.



Bit Stock Drills for Metal or Wood.



Wood-Boring Brace Drills, will cut off nails.

Reamers in all sizes. NEW YORK OFFICE, 33 CHAMBERS ST. Send for Catalogue.

Hand Taps,  
Mach. Screw Taps  
"Standard" Drill  
Chuck,  
"Ellenwood" Drill  
Chuck,  
Sq. Shank Drills  
for Ratchets,  
Twist Drills for  
Blacksmiths'  
Presses Sockets for  
Taper Shank  
Drills.

1874.

OLD RELIABLE.

SEND  
FOR  
CATALOGUE



1894.

WRITE  
FOR  
DISCOUNTS.

Our Drills are Hot Forged. The best part of the steel IS NOT CUT OUT and thrown away.

NEW PROCESS

TWIST DRILL COMPANY.

TAUNTON MASS.

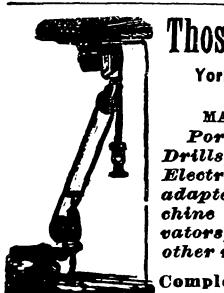
They are TOUGHER, STRONGER, BETTER than is possible to attain by milling. Catalogue and Discounts sent on application.

## STOW FLEXIBLE SHAFT,

Invented and  
Manufactured by

THE  
STOW MFG. CO.,  
Established 1875. Binghamton,  
N. Y.  
PORTABLE,  
DRILLING  
TAPPING,  
REAMING.

General European Agents,  
SELIG SONNENTHAL & CO.,  
85 Queen Victoria St.,  
LONDON, ENGLAND.



Thos. H. Dallett &amp; Co

York St. and Sedgley Ave.,  
PHILA.

MANUFACTURERS OF  
Portable Drills, Hand  
Drills, Boiler Shell Drills  
Electric Motors specially  
adapted for driving Ma-  
chine Tools, Cranes, Ele-  
vators, Pumps, Presses and  
other machinery.

Complete Power and Light  
Plants Installed.

## Stow Flexible Shaft Co., Limited,

26th, Callowhill &amp; Biddle Sts

PHILA., PA.,

Manufacturers of

PORTABLE DRILLING,  
TAPPING, REAMING  
and BORING MACHINES

Also, Tools for Emery Wheel  
Grinding, Metal and Wood Pol-  
ishing, Cattle Brushing, and  
Clipping, &c.

Gen'l European  
Agents.

Belling &amp; Lowe

2 Lawrence,

Powneys Hill

LONDON, ENGL.

## Morse Twist Drill & Machine Co.,

NEW BEDFORD, MASS.

Manufacturers of

Milling

Cutters,

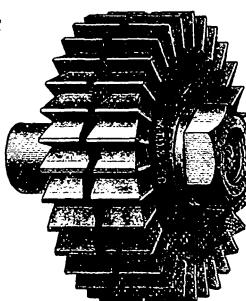
Heading

Mills,

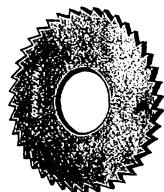
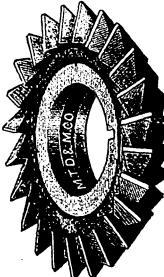
Interlocking

Mills,

And Mills of any shape and for any use.



Angular  
Mills,  
Slitting  
Saws,  
Screw  
Slotting  
Cutters,



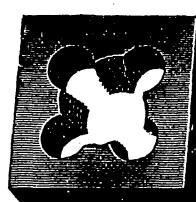
SEND FOR CATALOGUE.

## MANNING, MAXWELL & MOORE,

Sole Sales Agents for THE MORSE TWIST DRILL AND MACHINE CO.'S

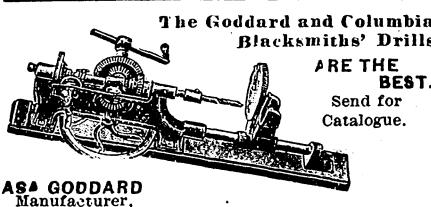
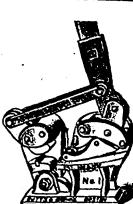


Manufacture of Patent Machine Relieved Nut, Hand,  
Blacksmith and Machine Screw Taps, Screw Plates, Tap  
Wrenches and Patent Relieved Pipe Taps and  
Pipe Reamers; also of Solid Bolt and Pipe  
Dies. Furnished in V, U. S. Standard and  
Whitworth shape of threads.



111 Liberty Street,

NEW YORK.

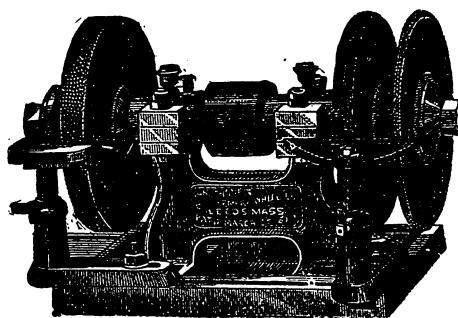
The Goddard and Columbia  
Blacksmiths' DrillsARE THE  
BEST.Send for  
Catalogue.B. & O. SURE GRIP  
TIRE UPSETTER.IT IS WITHOUT A FAULT. ONE  
MOTION DOES IT ALL.Every machine is tested and  
warranted. Send for Price.BUTTS & ORDWAY,  
500 Atlantic Ave., Boston, Mass.

# NORTON EMERY WHEEL COMPANY.

Illustrated CATALOGUE free upon application.

Over 100,000 wheels in Stock.

WORCESTER, MASS.



ESTABLISHED 1867.

CAPITAL \$100,000

Northampton Emery Wheel Co.,

LEEDS, MASS.

And 20 South Canal St., Chicago,

MANUFACTURERS OF

**EMERY WHEELS**

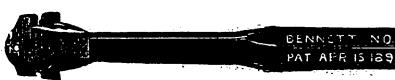
— AND —

EMERY WHEEL MACHINERY

Of Best Quality.

Send for Catalogue.

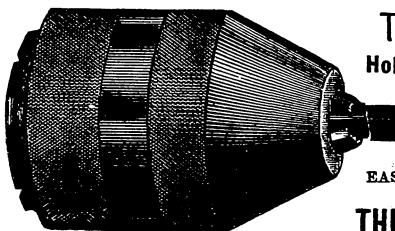
FACTORY AT LEEDS, MASS



BENNETT NO. 1  
PAT. APR. 15, 1890.

THE Bennett Emery Wheel Dresser

Does the best work, does it easy, quick and the most for the least money. Manufactured by Bay State Stamping Co., 17 Hermon Street, Worcester, Mass.



THE NEW GIANT DRILL CHUCK.

Holds a Drill With the Grip of a Giant. All Steel Parts Interchangeable.

SIMPLE IN CONSTRUCTION.

EASY TO TAKE APART AND CLEAN. BEST OF WORKMANSHIP AND VERY CHEAP. Manufactured and sold by

THE SMITH & EGGE MFG. CO., Bridgeport, Conn.

WRITE FOR

**Our New 1894 Catalogue,**

JUST ISSUED,

SHOWING SEVERAL NEW MACHINES, a number of which have been designed specially for

**BICYCLE MANUFACTURING.**

Also showing REDUCTION IN PRICES on some of our regular machines

**THE GARVIN MACHINE CO.,**

Laight and Canal Sts., NEW YORK.

**ELEVATORS.**

Hydraulic, Steam, Electric and Hand-  
for Passenger and Freight.

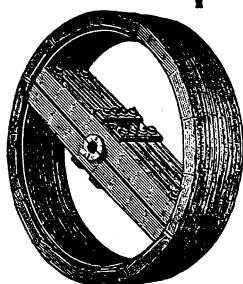
Any Carpenter can put them up.  
And the Hardware Dealer can make a splendid profit selling them.  
We also make a full line of Dumb Waiters and Lifts.

**The WARNER ELEVATOR MFG. CO.**

BRIGHTON STATION, CINCINNATI, O.

**Wood Split Pulley.**

Strongest,  
Lightest,  
Simplest,  
Cheapest!



REEVES PULLEY CO.,  
1220 E. 7th Street, New York Agents, Columbus, Ind.  
Patterson, Gottfried & Hunter, 146-150 Centre St.

**The Best On Earth.**

THAT IS WHAT THEY ALL SAY OF  
**BEREA GRINDSTONE**

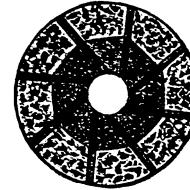
Of which we are the sole manufacturers.

Send for prices and our Catalogue C, showing Mounted Grindstones, Scythe Stones, &c.

**The Cleveland Stone Co.,**  
**CLEVELAND, O.**

Patent ROCK EMERY MILL STONES.

Next to  
Diamonds  
in  
Hardness  
and  
Durability.



Made to  
Fit Any  
Mill Frame  
without  
change.

Cuts every substance with unexampled rapidity; always sharp; emery face Never Dressed. As much more Durable than other stones as they are Harder. Never Glaze; grind everything. Most Rapid Grinder known.

Send for Circular.

STURTEVANT MILL CO., Boston, Mass.



Foot Power Miterer  
and Jointer.

**THE EGAN CO.,**  
179 to 199 W. Front St.,  
CINCINNATI, OHIO, U. S. A.

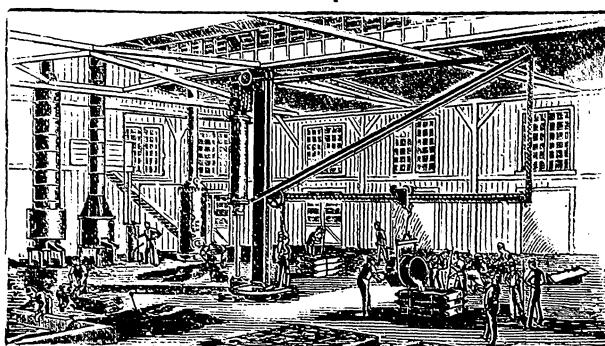
MAKERS OF  
**WOOD-WORKING**  
**MACHINERY**  
FOR ANY PURPOSE.  
Highest honors World's Fair

# All We Ask.

## USERS.

The Largest and Best Concerns.

Frazer & Chalmers.  
Gaar, Scott & Co.  
J. I. Case Threshing Machine Co.  
Colorado Fuel & Iron Co.  
Solid Steel Co.  
Sterling Boiler Co.  
Otis Bros. & Co.  
Geo. V. Cresson Co.  
Pittsburgh Steel Casting Co.  
Eynon-Evans Mfg. Co.  
Harrison Safety Boiler Co.  
Hoopes & Townsend  
Hughes & Patterson.  
Shickle, Harrison & Howards Iron Co.  
Rensselaer Mfg. Co.  
Buffalo Cast Iron Pipe Co.  
Buffalo Furnace Co.  
National Pipe & Foundry Co.  
John Brennan & Co.  
Murray Iron Works.  
Danville Foundry & Machine Co.  
Sears & Nicols.  
Moore & Brady.  
Pearson & Co.  
Morton Reed & Co.  
Benj. Atha & Illingworth Co.  
Montgomery Furnace Co.  
John Q. Denny.  
I. G. Johnson & Co.  
Canda Mfg. Co.  
Crane & Breed Mfg. Co.  
Diamond State Iron Co.  
Hartman Mfg. Co.  
Blankley Bros. & Co.  
Port Henry Furnace Co.  
Wm. L. Bailey & Co.  
Akron Iron Co.  
And others.



5-ton Ridgway Crane in Foundry Diamond State Iron Co., Wilmington, Del.

## IDEAL CRANE FOR FOUNDRY OR MILL.

Rapid, Safe, Sure and not costly. No pumps, no accumulator, no shocks, no bother with valves and packings. None of that awful waste of power. No freezing. No bother of any sort.

Attached to any steam supply is ready for business at once. Uses so little steam it is never missed. No special operator required. Absolutely safe. Being balanced it is easy on buildings. Sets indoors or outdoors. So cheap any plant can use it. Earns its cost always in few months.

The best concerns everywhere are getting them. Look each side of you. Some have eight or nine or more of them. They save dollars in handling goods; that's the reason. Does the work while other cranes are getting ready to do it.

We make many styles—also Elevators.

### SEND FOR CIRCULAR.

**CRAIG RIDGWAY & SON,**  
COATESVILLE, PA.

## USERS.

The Largest and Best Concerns.

Penna. Steel Co.  
Illinois Steel Co.  
National Tube Works Co.  
Phoenix Iron Co.  
Henry Dillston & Sons Co.  
A. & P. Roberts Co.  
Catasauqua Mfg. Co.  
Mahoning Rolling Mill Co.  
Harrisburg Rolling Mill Co.  
New Phila. Iron & Steel Co.  
Old Dominion Iron & Steel Co.  
Standard Iron Co.  
Cambria Iron Co.  
Johnson Co.  
Norristown Steel Co.  
Midland Steel Co.  
Kellogg Seamless Tube Co.  
American Steel Wheel Co.  
Benwood Steel Co.  
Bellaire Nail Works.  
Oliver Iron & Steel Co.  
Jones & Laughlin.  
West Superior Iron & Steel Co.  
Nova Scotia Iron & Forge Co.  
Reading Iron Co.  
Spang Steel & Iron Co.  
Apollo Steel & Iron Co.  
Glasgow Iron Co.  
Harrisburg Car Co.  
Atlantic Refining Co.  
W. W. Kurtz & Sons.  
Kilmer Mfg. Co.  
J. W. Friend & Co.  
American Wire Nail Co.  
New Haven Wire Co.  
E. & G. Brooke Iron Co.  
Passaic Rolling Mill Co.  
Moorehead-McCleane Co.  
And others.

## SELL THE BEST.

**THE "SURE GRIP"**  
Steel Tackle Block

is taking the place of all other hoisting blocks.

Send for catalogue and discount.

Fulton Iron & Engine Works,

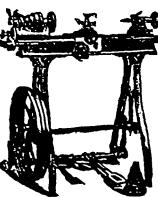
28 Brush St., Detroit, Mich.

ESTABLISHED 1852.

FOR SALE IN CANADA BY

Rice Lewis & Son, Ltd.,

TORONTO, CAN.



## Foot & Hand Power Machinery.

Screw Cutting Lathes, Wood Turning Lathes, Scroll Saws,  
Circular Saws, Moulder, Mortisers, Etc.

Strictly High Grade. Catalogue Free.

**SENECA FALLS MFG. CO.,**  
255 Water St., Seneca Falls, N. Y., U. S. A.

London Agency, MESSRS. CHAS. CHURCHILL & CO., 21 Cross St.,

Finsbury, London, E. C., England.



**BORING AND TURNING MILLS,**  
UNIVERSAL, RADIAL AND UPRIGHT DRILLS,  
ALL SIZES.

BICKFORD DRILL & TOOL CO.,  
10 Lawrence Street, Cincinnati, O.



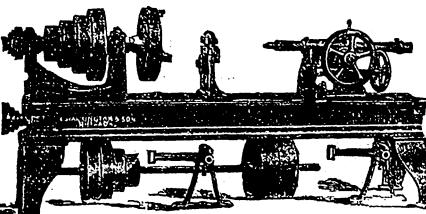
## LA THESES.

ISRAEL H. JOHNSON, JR. & CO., - PHILADELPHIA.

**EDWIN HARRINGTON, SON & CO., Incorporated,**

1508 PENNA., AVE. PHILADELPHIA, PA.

—: DESIGNERS AND MANUFACTURERS :—



Improved

SEND  
FOR  
PRICES.

Lathes,  
Drills,  
Planers.

Double Chain Hoists.



Highest Efficiency.

WESTON'S NEW

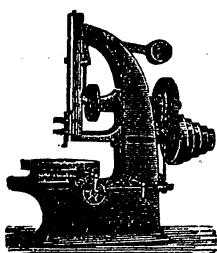
**TRIPLEX**  
Chain Block

far exceeds all predecessors.  
Send for Prof. Thurston's report  
of comparative tests of all  
chain pulley blocks.

The Yale & Towne Mfg. Co.  
STAMFORD, CONN.

New York, 84-86 Chambers St.  
Chicago, 152-154 Wabash Ave.  
Philadelphia, 1120 Market St.  
Boston, 224 Franklin St.

**Engine Room Chat.** By ROB. GRIMSHAW. This little book presents in colloquial style ideas which appeal to all interested in the generation of power, more particularly those charged with the care of engines and boilers and their appurtenances. 148 pages, cloth. \$1.00  
For sale by DAVID WILLIAMS, 96-102 Reade St., N.Y.



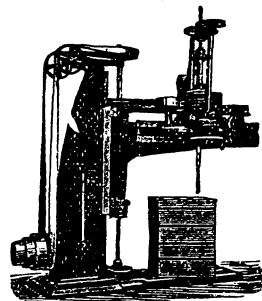
*William Sellers & Co., Inc.*

PHILADELPHIA, PA.,

—MANUFACTURERS OF—

Improved Machine Tools for Working Iron and Steel,  
High Speed Power Traveling and Swing Cranes,  
Injectors, Locomotive Turn Tables, Shafting, &c., &c.  
Testing Machines, under patents of A. H. Emery.

Prices, Descriptive Matter, &c., Furnished on Application.



**MORSE,  
WILLIAMS  
& CO.**

Morse Elevator Works.

MANUFACTURERS AND BUILDERS OF  
ELECTRIC, HYDRAULIC, BELT and HAND  
POWER PASSENGER and FREIGHT

**ELEVATORS.**

1105 Frankford Ave., Philadelphia. 108 Liberty St., New York  
1116 E. St., N. W., Washington, D. C. 33 Lincoln St., Boston.  
425 Spruce St., Scranton, Pa. 82 Church St., New Haven  
Omaha Building, Chicago, Ill.

**FAIRMOUNT MACHINE CO.,**

(Successors to Thomas Wood & Co.)

Twenty-second and Wood Sts., Philadelphia, Pa.  
Shafting, Gearing, Self-Oiling Bearings, Friction Pulleys, Elevators.

Rope Transmission; Sheave Wheels, any size required, for Hemp, Manila and Cotton Rope Driving. Looms, Cotton and Woolen Machinery for Winding, Spooling, Reeling, Beaming, Warping, Dyeing, Sizing, Scouring &c.

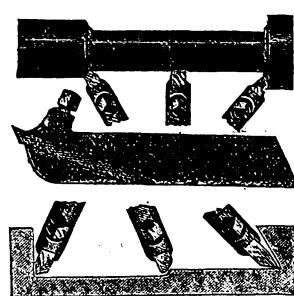
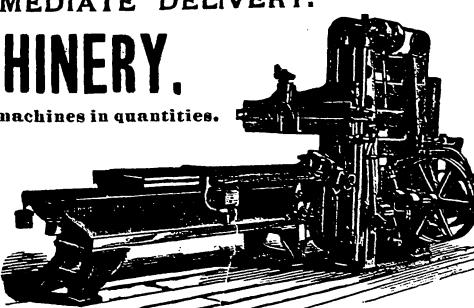
**OPEN SIDE PLANERS.**

READY FOR IMMEDIATE DELIVERY.

**SPECIAL MACHINERY.**

We will take pleasure in estimating on machines in quantities.

**DETTRICK & HARVEY  
MACHINE CO.,  
MANUFACTURERS,  
BALTIMORE, - - MD.**

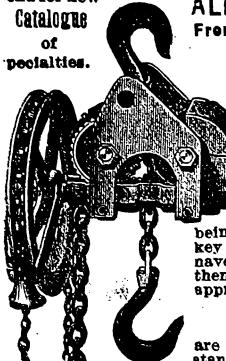


Patented February 28, 1893.

The Armstrong  
Tool Holder.  
For General  
Lathe and  
Planer Work.  
A practical sub-  
stitute for  
Forged Tools.  
Saves forging,  
dressing, and  
tempering, 70  
per cent. grind-  
ing, 90 per cent.  
tool steel. Over  
10,000 now in  
use by such firms  
as J. A. Fay &  
Egan Co., Frick  
Co., Morris Ma-  
chine Works, W.  
P. Callahan &  
Co., Walburn.

Swenson Co., Fitchburg Machine Works, Lodge & Shipley Machine Tool Co., and many other large concerns. Seven Sizes, suitable for all kinds of work. Tools sent on trial to responsible parties. Manufactured only by Armstrong Bros. Tool Co., 76-78 Ridgewood Ave., Chicago.

Send for new  
Catalogue  
of  
specialties.



**ALFRED BOX CO.,**  
Front, Poplar and Canal Sts.  
Philadelphia, Pa.

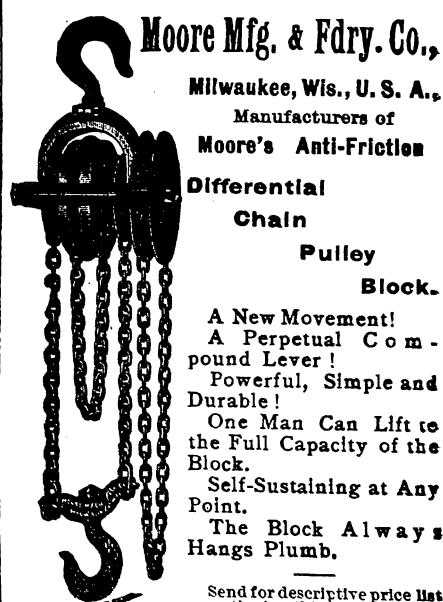
Manufacturers of  
Box's Pat. Double

**Screw Hoist**  
13,000 in use.

Many have done hard  
continuous duty 5 years  
without a single part  
being renewed. This is the  
key of our success. They  
have built up a reputation  
themselves that cannot be  
approached. Our improved

**Radial Drills**

are also assuming the same  
standard.



**Moore Mfg. & Fdry. Co.,**

Milwaukee, Wis., U. S. A.,

Manufacturers of

Moore's Anti-Friction

Differential

Chain

Pulley

Block.

A New Movement!  
A Perpetual Com-  
pound Lever!

Powerful, Simple and  
Durable!

One Man Can Lift to  
the Full Capacity of the  
Block.

Self-Sustaining at Any  
Point.

The Block Always  
Hangs Plumb.

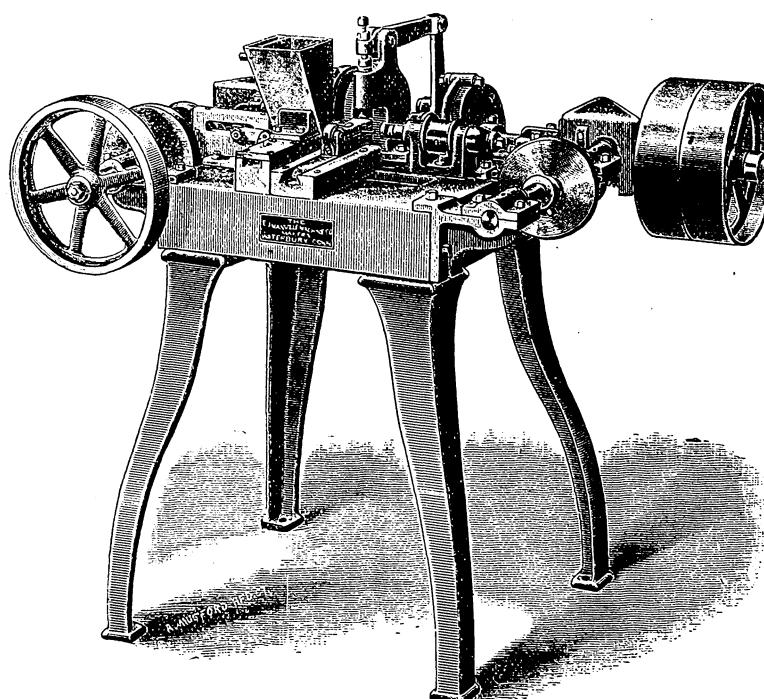
Send for descriptive price list.  
mentioning this paper.

# THE E. J. MANVILLE MACHINE CO.,

MANUFACTURERS,

WATERBURY, CONN.

IS designed with a hopper or receiver in which wires already cut to required lengths can be placed and automatically taken one by one to the milling tools, which are adjustable so that one or both ends can be milled as much or as little as required at one operation.



SEMI-AUTOMATIC WIRE-MILLING MACHINE.

The machine is so constructed that it can be easily adapted to wires requiring considerable depth of shoulder or a long beveling point, according to the requirements of the work to be performed.

The operating of these machines is so simple that a boy can attend to several in connection with others.

When making inquiries, inclose a sample of the work to be done, with all the necessary information.

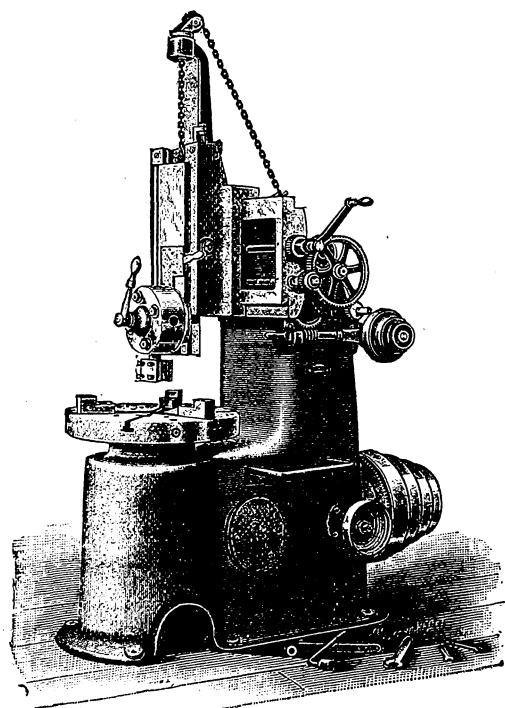
SPECIAL  
AUTOMATIC  
MACHINES.

POWER PRESSES.

WIRE WORKING  
MACHINES.

# SOMETHING NEW.

30 Inch Vertical Chucking and Facing  
Machine, with Back Gears.



Capacity, 30 inches in diameter and 14 inches in height, under the rail.

Table is 24 inches in diameter and has a universal chuck.

Feeds are automatic in all directions and are provided with trips.

Countershaft has one 16-inch and one 20-inch pulley, giving 16 changes of speed, 8 with cone and 8 with back gears.

*Let Us Send More Complete Information.*

**BRIDGEPORT MACHINE TOOL WORKS,**

**E. P. BULLARD, Prop., - Bridgeport, Conn.**

**N. Y. OFFICE, 39 Cortlandt Street, Room 86.**

**SECOND-HAND  
MACHINERY,  
BOILER and BRIDGE  
TOOLS  
IN STOCK  
for Immediate Delivery.**

**ENGINE LATHES.**

12 in. x 6 ft. Reed.  
13 in. x 6 ft. Blasdell.  
14 in. x 6 ft. Hendey.  
16 in. x 6 ft. New Haven.  
16 in. x 6 ft. Ames.  
18 in. x 6 ft. Eddy.  
18 in. x 8 ft. Putnam.  
20 in. x 10 ft. Fitchburg.  
22 in. x 8 ft. Prentiss.  
24 in. x 12 ft. Putnam.  
30 in. x 10 ft. Pond.  
32 in. x 16 ft. Gleason.  
34 in. x 20 ft. Lincoln.

**BRASS LATHES.**

14 in. x 6 ft. Springfield.  
15 in. x 6 ft. Am. Tool Co.

**PLANERS.**

19 in. x 3 ft. Wheeler.  
20 in. x 4 ft. Lathe & Morse.  
22 in. x 6 ft. Wheeler.  
24 in. x 4 ft. Blasdell.  
24 in. x 5 ft. New Haven.  
26 in. x 6 ft. Pease.  
26 in. x 8 ft. Pease.  
30 in. x 6 ft. Pease.  
30 in. x 8 ft. Pease.  
32 in. x 6 ft. Wood & Light.  
32 in. x 7 ft. Hewes & Phil.  
36 in. x 8 ft. Pease.  
36 in. x 16 ft. Bancroft.

**SHAPERS.**

6 in. Stroke. Crank.  
8 " Gould.  
15 " Hendey.  
16 " Gould & Eber.  
22 " Geared.

**SLOTTERS.**

10 in. Stroke. Lowell.  
14 in. Stroke. Hewes & Phil.

**J. J. McCabe,****14 Dey Street, - New York.**Successor to E. P. BULLARD'S N. Y. Machinery  
Warerooms.**New and Second-Hand Machinery.**

1 64 in. x 16 ft. Engine Lathe. Second-hand.  
1 26 in. x 18 ft. Lowell Lathe.  
1 20 in. x 12 ft. Hubbard Lathe. Compound  
Rest. Power Feed. New.  
1 20 in. x 8 ft. Gleason Lathe. Second-hand.  
1 18 in. x 6 ft. Pond Lathe. Second-hand.  
1 17 in. x 6 ft. Putnam Lathe. Second-hand.  
2 16 in. x 6 ft. Davis Lathes. New.  
2 18 in. x 8 ft. " "  
1 13 in. French Turret Lathe. New.  
1 30 in. x 30 in. x 8 ft. Davis Planer. New.  
1 24 in. x 24 in. x 8 ft. "  
1 22 in. x 22 in. x 5 ft. Putnam Planer. Second-  
hand.  
1 20 in. x 20 in. x 5 ft. Putnam Planer. Second-  
hand.  
1 13 in. x 8 in. x 3 ft. Planer. Second-hand.  
1 30 in. x 6 ft. Radial Drill Press. New.  
1 28 in. New Haven Drill Press. Power Feed.  
Second-hand.  
2 32 in. B. G. & P. F. Davis Drills. New.  
2 25 in. B. G. & P. F. " " "  
6 20 in. Davis Standard Drills. New.  
3 20 in. " B. G. Drills. "  
10 20 in. " Combined Wheel and Lever Drills.  
New.  
2 16 in. Sensitive Drills. New.  
1 Brown & Sharpe Heavy Milling Machine.  
Second-hand.  
1 1 1/2 in. Bolt Cutter. Second-hand.  
1 No. 1 Garvin Milling Machine. Second-hand.  
3 3 in. Davis Cutting-Off Machines. New.  
1 4 1/2 in. Davis Cutting-Off Machine. New.  
This list will be changed each week.

**W. P. DAVIS,****Rochester, N. Y.****Second-hand Machinery For Sale.**

2 86 in. x 11 ft. Horizontal Stationary Boilers.  
1 12 H.-P. Upright Engine (Greenfield).  
1 18 H.-P. Upright Boiler.  
1 15 H.-P. Horizontal Engine.  
1 1/2 to 1 1/4 in. Open Die Bolt Cutter.  
1 24 in. x 25 ft. Engine Lathe.  
2 No. 2 Roots' Blowers.  
2 No. 6 Roots' Blowers.  
Also other machinery at low prices.

COOKE & CO.,  
163 and 165 Washington St., New York.**FOR SALE.**

Wright Automatic Engine, 16 in. x 32 in.  
Ball Electric Light Engine, 13 in. x 14 in., 100 H.-P.  
F. MCSWEGAN & SONS,  
Dover St. and Franklin Square, N. Y.

**BARGAINS  
IN SECOND-HAND  
BOILERS.**

Good for 100 lbs. Pressure and upwards  
in the Hartford Boiler Inspection Co.  
Eight 50 to 70 H.-P. Locomotive Boilers, 54 in. x  
15 ft., 123 2/4 in. Tubes, built 1/2 in. steel.  
Ten 100 H.-P. Vertical Boilers, 60 in. x 16 ft., 162  
2 in. Tubes, built 1/2 in. and 3/4 in. steel.  
Two 40 H.-P. Vertical Boilers, 42 in. x 10 ft., 120  
2 in. Tubes, built 5-16 in. steel.  
Boilers are complete with a full equipment of  
fittings. Will sell at lowest prices.

**L. F. SEYFERT'S SONS,**  
437-441 N. 3d St., Philadelphia, Pa.

**SECOND-HAND  
MACHINERY.**

14 in. x 6 ft. Fitchburg Engine Lathe.  
1 1/2 in. x 8 ft. "  
21 in. x 14 ft. "  
15 in. x 8 ft. Plain Turning Engine Lathe.  
24 in. x 12 ft. Chamberlain Engine Lathe.  
9 in. New York Steam Engine Co. Shaper.  
8 in. Niles Semi-Universal Radial Drill.  
9 in. Niles Slotting Machine.  
60 in. Niles Pulley Borer.  
60-96 in. Niles Pulley Lathe.  
4 ft. 3 1/2 in. Betts Mch. Co. Hand Boiler Rolls.  
8 ft. 3 in. " " " "  
8 ft. Morgan, Williams and Co. Power Boiler  
Rolls.  
No. 37 Morgan, Williams and Co. Comb. Punch  
and Shear.  
20 in. throat Betts Machine Co. Double End  
Punch and Shear.  
25 in. x 25 in. x 5 1/2 ft. Hubener Screw Planer.  
51 in. x 45 in. x 15 1/2 ft. New Haven Planer.  
All in good order.

Also 600 new and second-hand tools in  
stock. Send for list.**PRENTISS TOOL & SUPPLY CO.,****115 Liberty Street, NEW YORK.****59 South Canal Street, CHICAGO, ILL.****FOR SALE.**

Engines with Cylinders 26 in. x 48 in. and  
smaller.  
Portable, Tubular and Vertical Boilers of all  
sizes.  
13 2-yard 8-ft. gauge all around Dump Cars.  
7 Narrow Gauge and 2 Standard Gauge Loco-  
motives.  
1 Large Worthington Duplex and other Press-  
ure Pumps. New and Second hand.  
Hoisting Engines and Grinding Pans.  
Rail, Sheet and Clipping Shears.

**THOMAS CARLIN'S SONS,**  
Allegheny, Pa.

PLANNER, 24 in. x 24 in. x 8 ft., table. Good order \$185.00  
36 in. x 24 ft. Bk. Gd. Sc. Cur'g Rebuilt Lathe.. 650.00  
No. 1 Dallett Portable Drill. Good as new..... 90.00  
88 in. Bk. Gd. Drill, heavy. Good as new..... 275.00  
2 1/4 in. Heavy Lever Feed Drill. New..... 60.00  
Forging Drop, 100-lb. Hammer, New Design... 160.00  
Wire Straightener and Cutter, Semi-Aut.... 60.00  
Bolt Cutter, New Head and Dies, 3/8 to 1 1/2 in.... 175.00  
Power Punch Presses..... \$75.00 and upward.

AMER. TOOL WORKS. Cleveland, O.

**FOR SALE.**

2 Double Deck Boilers about 40 H.-P. each,  
cheap. Hoisting Engine. Cylinder Boilers for  
Stacks, 30, 36 and 42 in. diameter. Round and  
Square Iron Tanks. Blow Offs. 5 Brass Cannons  
about 1400 or 1500 pounds each. Good  
order. All kinds of Scrap Iron and Metals on  
hand.

BUNSENIUS & CUNLIFFE,  
12th and Washington Ave., Philadelphia.**WANTED.**

Wrought and S'el Scrap, Boiler Plate, Cast  
Machinery Scrap, Stove Plate and Burnt Iron.

JOHN W. SWANGER & CO.,  
Crum Lynne, Pa.

**FOR  
MACHINERY**

ADDRESS US.

**Pennsylvania Mch. Co., Ltd.,**  
PHILADELPHIA, PA.

**Machinery,**

New and Second-Hand, For Sale.

93 in. Hydraulic Riveter, No. 12 Turret Machine,  
Pump, Accumulator, Travelling Crane, Jones & Lamson.  
100 in. Swing Engine Lathe, 20 ft. Bed.  
No. 2 Plate Planer, 16 1/2 ft. one setting up to 1 inch  
Plates.  
No. 27 Shear, 30% in. throat, cuts 2 1/2 in. Plate.  
All the above are New: Bement, Miles & Co. make.  
Power Bending Rolls, 8 ft. 3 in. between Housings.  
PLANERS.  
72 in. x 60 in. x 24 ft. 4 Heads.  
60 in. x 60 in. x 16 ft. 2 Heads.  
69 in. x 52 in. x 15 ft. 1 Head.  
30 in. x 30 in. x 12 ft. 1 Head.  
Other sizes smaller.  
36 x 36 x 18 ft. Gray Co. Switch Planer, 2 Heads, Good as new.  
Drill Presses, Radial Drills, Gang Drills, Mill'g Mch. No. 1 and 3 Univ. Millers, B. & S. Allen Pneumatic Riveter for Bridge work.  
Bolt Cutters 1 1/4 & 2 in. 18 x 42 Corliss Hor. Engine.  
1 1/4 x 15 Phoenix Aut. Eng. 13 x 12 " N. Y. S. E. Co.  
13 x 12 " 10 x 12 Slide Val. Hor. Eng. Blake Duplex Compound Pumps, &c.

Send For Latest List.

**Ceo. Place Machine Co.**Warehouse, 511 & 513 West 13th St.  
Office, 120 Broadway, New York.**32-INCH UPRIGHT DRILL PRESS.**

TWO OF THEM; SECOND HAND.

Makers' Name, KERKHOFF & CO.  
Height, 8 ft. 2 in.

Greatest Distance Spindle to Base Plate, 52 in.  
Greatest Distance Table to Spindle, 38 in.  
Weight complete, 2000 lbs.

Back Geared and Power Feed, Quick Return, Balanced Spindle; Shafts and Studs made of Steel.

THE SCRANTON SUPPLY &amp; MACHINERY CO., SCRANTON, PA.

**For Sale, Very Low  
for Cash.**

500 tons Relaying Steel Street Rails, side bearing, 35 to 47 lb. sections. Also 65-lb. Steel T's.

WM. H. PERRY &amp; CO., Providence, R. I.

**SEE HERE!**

1 each Garvin No. 2 & No. 4 Milling Machines, 2d hand.  
1 Pratt & Whitney Lincoln Miller No. 3, 2d hand.  
1 in. Henley Pulley Lathe, 2d hand.  
1 Lodge & Davis 17 x 6 Engine Lathe, 2d hand.  
1 Pratt & Whitney 19 x 6 Engine Lathe, 2d hand.  
1 Lodge & Davis, 21 x 8 Engine Lathe, 2d hand.  
1 Dietz Gang 22 x 8 Engine Lathe, 2d hand.  
1 New Haven 28 x 8 " "  
1 Dietz Gang 80 in. Radial Drill, " "  
1 20 in. Lever Drill, new.  
each Lodge & Davis 15 in. and 20 in. Shaper, new.  
1 Gear Cutter, will cut up to 40 in., 2d hand.  
1 Baker Bros. Universal Saw Bench, new.  
A full line of the most improved Turret Lathes, and  
Pulley machinery, also Motor Gear Cylinder Boring and Triple Facing Machines.

THE LODGE &amp; SHIPLEY MACHINE TOOL CO., 107-113 Culvert St., Cincinnati, Ohio.

**For Sale Cheap.****Special lot of  
NEW ENGINE LATHES,**

13 in. x 5 ft. 17 in. x any length bed.  
15 in. x 6 ft. 27 in. x any length bed.  
27 in. x 12 ft. 30 in. x any length bed.  
32 in. x 12 ft. 32 in. x any length bed.

ADDRESS

**Draper Machine Tool Co.,**  
Successors to  
**LATHE & MORSE TOOL CO.,**  
130 Gold Street, **WORCESTER, MASS.**

# BARGAINS.

24 x 48 Miller & Allen Corliss Engine.
16 x 36 Slide Valve Engine.
16 x 24 " " New.
15 x 30 " " "
15 x 18 " " "
14 x 30 " " "
12 x 20 " " New.
14 x 20 Vertical " "

A large number of new and second-hand Boilers, Engines, Lathes, Planers, Shapers, Millers, &c., in stock.

Write us for what you want and we will give you prices and full information.

**LOVEGROVE & CO.,**  
Third and Quarry Sts., Phila., Pa.

## SECOND-HAND MACHINERY.

One Fifield Screw Cutting Engine Lathe, 30 in. swing on 16 ft. bed, with blocks to raise same to swing 47 in.  
One Fifield Screw Cutting Engine Lathe, 38 in. swing on 14 ft. bed.  
One Pratt & Whitney 36 in. Gap Chucking Lathe.  
One Pease Planer, 24 in. x 24 in. x 6 ft.  
One Iron Planer, 52 in. wide, 44 in. high, 12 ft. long, with two heads on the cross rail.  
One L. W. Pond Gear Cutter, to cut gears 36 in. diameter, 5 in. face, also arranged for cutting bevels.

**HILL, CLARKE & CO.,**  
156 Oliver St., Boston, Mass.  
12 and 14 South Canal St., Chicago, Ill.

**SECOND-HAND MACHINERY.**  
1 Iron Planer 60 in. x 60 in. x 20 ft., 2 heads on Cross Rail.  
1 Iron Planer 34 in. x 26 in. x 7 ft. 1 30 in. x 30 in. x 8 ft.  
1 Iron Planer 24 in. x 24 in. x 4 ft. 1 32 in. x 25 in. x 6 ft. 6 in.  
1 Iron Planer 16 in. x 12 in. x 3 ft. 1 20 in. x 20 in. x 5 ft.  
1 Engine Lathe 48 in. x 16 ft., raised to 60 in., Putnam make.  
1 Engine Lathe 36 in. x 14 ft., Putnam make.  
1 " 37 in. x 17 ft., D. W. Pond make.  
1 " 26 in. x 10 ft., " "  
1 " 24 in. x 25 ft. 6 in., A1. 1 24 in. x 14 in., New Haven.  
1 Engine Lathe 20 in. x 12 ft., New Haven. 1 18 in. x 8 ft., New Haven.  
1 Drilling Machine, 40 in., B. G. S. F. 1 36 in., B. G. S. F. both New Haven.  
1 Drilling Machine 30 in., R. G. Gould.  
1 13 in. Shaping Machine, Gould.  
1 Pond Index Milling Machine.  
1 600 lb. Merritt Drop Friction.  
1 425 in. Peck Lift, Geared.  
All kinds of Iron and Wood Working Machinery.  
Lists sent. NEW YORK MACHINERY DEPOT,  
Office 178 Broadway, N. Y.

**Don't Overlook These Bargains.**  
2 66 x 16 Horizontal Return Tubular Boilers.  
1 62 x 15 " " "  
1 18 H.-P. Vertical Boiler, New.  
1 23 H.-P. " "  
1 40 H.-P. Double Decked, Second-hand.  
1 8 H.-P. Portable Engine and Boiler, Second-hand.  
1 10 H.-P. " " " New.  
2 10 H.-P. " " " Second-hand.  
1 80 H.-P. Ball Automatic Engine, good condition.  
1 No. 1 Exeter Blower, New.  
1 8 H.-P. Vertical Boiler on wheels.  
OLIVER C. BOYD, Lebanon, Pa.

## WANTED.

Second-hand, about 30 gallon, Iron Steam Jacket Kettle. Quote price and advise condition. W. L. BLAKE, & CO., Portland, Me.

## FOR SALE.

One 25 H.-P. Otto Gas Engine in first-class condition. Can be bought very reasonable. BIRMINGHAM IRON FOUNDRY, Birmingham, Conn.

## RELAYING RAILS.

10 Tons 80 lbs. Steel Rails.  
50 Tons 65 lbs. Steel Rails.  
130 Tons 30 lbs. Steel Rails.  
20 Tons 25 lbs. Steel Rails.  
4 Tons 12 lbs. Iron Rails.

## CAST IRON PIPE.

36 Lengths 14 in. dia. Bell and Spigot.  
21 Lengths 16 in. dia. Bell and Spigot.  
23 Lengths 20 in. dia. Bell and Spigot.  
All perfect. Prices the lowest ever heard of.

**THOS. P. CONARD,**  
206 Walnut Place, Philadelphia.

## SECOND HAND.

36 x 48 Corliss Engine, 50-ton wheel.  
34 x 60 " " 25 " "  
30 x 60 " " 25 " "  
28 x 60 " " 25 " "  
26 x 60 " " 25 " "  
26 x 48 Greene " 25 " "  
22 x 42 Wright " 10 " "  
18 x 48 Corliss " wheel to suit.  
18 x 36 " " "  
5-ton Fly Wheel, 26 ft. diameter.  
25 " " 20 ft. "  
Smoke Stack, 4 ft. diameter, 60 ft. long; 3 pieces.  
" " 5 ft. " 78 ft. " 13 "  
" " 6 ft. " 80 ft. " 8 "  
Surface and Jet Condensers; Fire, Feed and Vacuum Pumps; Feed Water Heaters. Write for what you need to

**MARVIN BRIGGS,**  
12 Broadway, New York

One 125 H.-P. Armington & Sims Automatic Engine.  
Two 125 H.-P. Phoenix Automatic Compound Engines.  
One 80 H.-P. Beck Automatic Engine.  
One 80 H.-P. Westinghouse Automatic Engine.  
10, 20, 30, 40 and 50 H.-P. Automatic Engines.  
100, 200, 300 and 500 H.-P. Berryman Feed Water Heaters.  
All the above in first-class condition and cheap.

FRANK T. OMEY,  
131 N. Third St., Philadelphia, Pa.

## Second-hand T Rails FOR BUILDERS' USE AND RELAYING FOR SALE.

Second-hand Steel and Iron T Rails of all sizes. Sound and selected and cut to specified lengths promptly for builders' use, vaults, kilns, foundations &c. at low prices and quick delivery. All sizes of selected relaying T and Girder rails ready for shipment at bottom figures. Apply

JOSEPH JEWKES, Steel Rails,  
Pittsburgh, Pa.

**AT ALL TIMES**  
we have on hand Steam Pumps, Second-hand and New. Every Second-hand pump is tested and guaranteed before leaving shop. Write us for information, also for catalogue, circulars, prices, etc., of the celebrated "Hooker Patent Steam Pump," which we manufacture.

HOOKER-COLVILLE STEAM PUMP CO., St. Louis, Mo.

## SOME BARGAINS HERE.

1 Hendry Shaper, 15 in. stroke, imp. vise.  
1 14 x 26 in. Screw Cutting Engine Lathe, New.  
1 5 in. hole in Turret, 8 in. vise, Machine and Counter, \$25  
24 Hendry Counter of Machine, New.  
1 8-Spindle Gristle Drill Press, used 1 month.  
100 H.-P. Woodbury Engine, 2d-hand. Good order.  
2 50 H.-P. Woodbury Boilers. Good order.  
2 75 H.-P. Woodbury Boilers. Good order.  
1 75 H.-P. Ball Engine, 2d-hand. Good condition.  
Also a variety of Engines, Boiler Pumps, &c.  
And other machinery, new and second hand. Write for prices. **Machinists' Supply Company, 39, 41 and 43 Central Ave., Rochester, N. Y.**

## SALE OR EXCHANGE.

1 8 x 20 Lathe, Wood & Light.  
1 Bolt Header, new, guaranteed.  
1 5 H.-P. Gas Engine, new, guaranteed.  
1 10 H.-P. Gas Engine, new, guaranteed.  
1 10 H.-P. Horizontal Engine and Boiler.  
1 80 H.-P. Wright Engine.  
1 35 H.-P. Locomotive Boiler.  
1 Punch and Shears.  
6 Steam Pumps, &c., &c.  
H. H. MANSFIELD,  
126 Liberty Street, New York.

## WANTED.

To furnish reasonable estimates on specialties in light metal work.  
CLARK & COWLES, Plainville, Conn.  
Manufacturers of Clock Trimmings, Rivets, Springs &c.

## CORLISS

And Other Automatic Slide Valve Engines, Etc.

High Speed	Horizontal	Vertical
Corliss.	Auto.	Slide Valve, Slide Valve.
10 x 20	11 x 20	9 x 24
10 x 24	10 x 24	10 x 12
16 x 22	13 x 12	10 x 24
23 x 36	Horizontal Slide Valve.	11 x 20
26 x 48	23 x 36	12 x 18
30 x 60	16 x 36	12 x 24
30 x 72	15 x 24	7 x 5
	11 x 24	5 x 5
		HORIZONTAL BOILERS, 3, 6 x 16; 8, 5 1/2 x 16; 5, 5 x 16; 3, 5 x 18; 1, 4 1/2 x 12, and several others.
		LOCOMOTIVE BOILERS, 80, 46, 50, 100 and 150 H.-P. One 1000 gal. Duplex Fire Pump, Brennan Crusher, Bogardus Mill, Burr Mill, Fan Blower, Platform Scales etc., etc. Send for catalogue.

G. M. CLAPP, 74 Cortland St., New York.

## !!! FOR SALE !!!

BAKER BLOWERS, Nos. 3, 4, 4 1/2, 5, 5 1/2, 6, 7 and 7 1/2

ROOT BLOWERS, Nos. 1, 2, 3, 3 1/2 and 7.

Buffalo Blowers and Heating Apparatus.

1 Corliss Hand Wheel, 12 ft. x 24 in. in halves.

1 9" CLAYTON DUPLEX AIR COMPRESSOR, 22 in. Steam x 24 in. Air x 30 in. Stroke. Bargain.

A Variety of Machinery, very cheap.

Do you want to buy or sell Machinery? If so, write

C. R. BIGELOW, Machinery Expert,

46 Dey St., New York City.

## FOR SALE.

### SECOND-HAND

## IRON PLANING MACHINES.

30 in. x 30 in. x 10 ft., A1 Order.

## NEW PLANERS.

22 in. x 22 in. up to 120 in. x 120 in., ANY LENGTH.

FROG AND SWITCH POINT PLANERS,  
LOCOMOTIVE CONNECTION ROD PLANERS,  
GLOBE VALVE PLANERS.

**THE POWELL PLANER CO.,**  
Worcester, MASS.

## FOR SALE.

### SECOND-HAND

ENGINES, Horizontal and Vertical. All types and sizes up to 2000 H.P.

BOILERS, Vertical and Horizontal and 3 Batteries of "Heine" water tube.

MILLS, 3 high, 12 in., 20 in., 22 in., 30 in. and 36 in. 1 Reversing 32 in. Blooming Mill complete.

STEAM HAMMERS. Various sizes up to 10 ton.

SCHEARS. Cut from Bands to Blooms and one to cut Plates 1 1/4 in. thick, 90 in. long.

SQUEEZERS, ROLL LATHES, CRANES, GRINDING PANS, MACHINE SHOP TOOLS, &c.

LOCOMOTIVES. Fine condition, various sizes and gauges.

" If you don't see what you want, ask for it" of

B. M. EVERSON,  
301 Smithfield St., Pittsburgh, Pa.

DON'T INVEST in expensive tools or machinery or let a contract before getting our estimate for making novelties or parts.

Fine, difficult and accurate parts a specialty. White metal work at prices that cannot be duplicated. Inventions perfected. Models made. Secrecy and satisfaction guaranteed, and no extra charge for new ideas or improvements. To insure reply to letters of inquiry only, enclose stamp. THE H. H. FRANKLIN MFG. CO., Syracuse, N. Y.

## FOR SALE.

### CRANK and SHAPERS.

Write us for Bargains.

**J. STEPTOE & CO. Cincinnati, O.**

## WANTED.

Responsible parties to manufacture and sell on royalty, a cheap portable steel or iron **UL-VER BRIDGE**; it is adapted to all small streams, runs, etc., in roads, streets, **RAIL-ROADS**, etc.; improved roads is the order of the day; use this bridge, put it below the level of the road, cover it over and thus prevent jarring and wear and tear of vehicles, etc. Apply to W. A. NICHOLS, Girard Building, Philadelphia, Pa.

## WANTED.

Carload of 15 lb. to 26 lb. Second-hand Tee Rails.

**THE BERLIN IRON BRIDGE CO.,**  
East Berlin, Conn.

**SECOND-HAND MACHINERY.**

4 11 in. x 5 ft. Engine Lathes, Reed and Prentice.  
 2 12 in. x 5 ft. Young Speed Lathes.  
 2 15 in. x 8 ft. Reed Engine Lathes, R. & F. & P. R.  
 6 16 in. x 6 ft. Engine Lathes, Young, Reed, Blasdell and Flather.  
 2 18 in. x 8 ft. Engine Lathes, New Haven and Dustin.  
 2 20 in. x 6 ft. and 8 ft. Engine Lathes, Bullard.  
 2 20 in. x 8 ft. Pattern Lathe and Floor Stand.  
 20 in. x 6 ft. Bullard Turret Lathe (c), Power Feed.  
 Brainard No. 7 Millers, 2 with arm.  
 Brainard Heavy No. 6 Lincoln Pattern Miller.  
 Brainard No. 16 Universal Miller.  
 Brainard No. 5 Universal Millers.  
 B. & S. No. 1 Universal, complete.  
 Garvin Millers, Nos. 2, 3, and 4.  
 Blasdell 30 in. Single Spindle Drill.  
 Garvin 1 Spindle Profiling Machine.  
 Sensitive Drills, Slatte, 1, 2 and 3 spindle.  
 20 in. 38 in. Wood & Laithe Gap Drill.  
 P. & W. Drills, 1 and 2 spindle.  
 Bench Drills, capacity 6-18 in.  
 Suspension Drills, Pond, heavy.  
 Punch Presses, 1 Wilder and 1 Stiles.  
 Garvin No. 2 Wire Feed and Plain Screw Machines.  
 Garvin Small Gear Cutter.  
 Bullard 15 in. Stroke Shaper.  
 6 in. B. & P. Shaper, Hand and Power.  
 Bolt Cutters, 1½ capacity.  
 Speed Lathes, Garvin and Young.  
 No. 4 Diamond Grinder.  
 Forge.  
 27 x 27 x 8 ft. English Screw Planer.  
 8 ft. Vertical Boring Mill, 2 heads and pulley attach.  
 30 x 30 x 8 ft. Niles Planer.  
 Bement Axle Lathes, Single.  
 38 in. x 18 Engine Lathe.

**ALSO LARGE STOCK NEW TOOLS.**

**THE NILES TOOL WORKS CO.,**  
 Eastern Branch, 136, 138 Liberty St., N. Y. City.

New York Agents PRATT &amp; WHITNEY Co.

**FOR SALE, CHEAP.**

400 tons of 60 lb. Rails, 75 tons of 25 lb. Iron Rails, 400 tons of 35 lb. second-hand Iron Rails with fastenings, one 4 horse-power Engine and 8 horse-power Boiler. Also other Engines and Locomotives, second-hand. Sawed and Cut Rails a specialty.

J. H. RICHARDSON &amp; CO., Pittsburgh, Pa.

**BARGAINS, SECOND-HAND.**

The following tools have been carefully overhauled and placed in perfect order, and are bargains.

12 in. x 5½ and 14 x 6 Engine Lathes.  
 13 in. x 7 and 15 x 7 Engine Lathes. P. C. and Rod Feeds.  
 18 x 6 Porter Lathe, Compound Rest.  
 18 x 10 Engine Lathe, P. C. Feed.  
 24 in. B. G. Drill Press.  
 24 x 24 x 8 Planer.  
 New 10 in., 13 in., 15 in., and 22 in. Eng. Lathes.  
 Planers, Shapers, Drill Presses, &c.  
 SEBASTIAN LATHE CO., 113-115 Culvert St., Cincinnati, Ohio.

**CUPOLA.**

For sale, 6-ton "Bement" Foundry Cupola.

**CRANE.**

Forsale, 5-ton cap. "Yale" Traveling Crane.

G. W. SCHULTZ &amp; CO., 308 Walnut St., PHILADELPHIA.

**SECOND-HAND I-BEAMS FOR SALE.**

We have for sale 500 to 1000 tons of Steel Beams 15 inches high, 20 to 32 feet long, 60 lbs. per foot. The beams are painted, not rusty, perfectly straight, as good as new. Have been used about eight months. Will sell at a reasonable price according to quantity taken. Call or address at once,

**SWARTS IRON & METAL CO.,**  
 Chicago's Leading Scrap Iron House,  
 551 to 557 S. State St.,  
 CHICAGO, ILL.

**WANTED.**

Stocks of Hardware in exchange for improved and unimproved farm lands in Iowa, Nebraska and South Dakota. WILLARD L. FROST, Sioux City, Iowa.

**WRITE FOR STOCK LIST**

OF

**Shafting, Pulleys,  
 Hangers, Boxes,  
 Belting,  
 Couplings,**

USED AT THE WORLD'S FAIR.

The Belting is of the Best Quality, and the Shafting, Pulleys, Hangers, etc., are of the Highest Grade, and all of the material was in use such a short time that it is practically as good as new. This list comprises the entire outfit used in Machinery Hall, Transportation and Electrical Bldgs.

Now stored in our warehouses at Saginaw, Mich.

FOR PRICES ADDRESS

**WICKES BROS.,**  
 SAGINAW, MICH.

**A Bargain.**  
 A FINE  
 Business Opportunity

for a live business man or two partners who have \$25,000 to invest in a first-class, old, well established and well located

**JOBBING and RETAIL HARDWARE**

business, which did not lose money last year.

**STOCK IS WELL ASSORTED.**

Good location in large Eastern City. Reasonable lease of premises can be continued. This will bear full investigation. Parties who can command above amount of capital address

"BARGAIN," Box 315,  
 office of *The Iron Age*, 96-102 Reade St., N. Y.

**LODGE AND****DAVIS**

Machine Tool Co., Cincinnati, O., U. S. A.,

Have for sale a large line of first-class second hand Engine Lathes, Planers, Shapers, Drill Presses, Milling Machines, &c.

**WRITE FOR LIST AND PRICES.**

**RECEIVER'S SALE.  
 STRUCTURAL IRON WORKS.  
 BIDS INVITED.**

The entire Plant, fully equipped and ready for immediate operation, of the Riverside Bridge & Iron Works, situated at Paterson, N. J. (16 miles from New York City), and admirably located on the main line of the N. Y., L. E. & W. R. R., with switch connection. Area nearly 30 city lots. Plenty of skilled labor, strikes never have occurred. Facilities for handling the heaviest as well as light work. Will be sold at a great sacrifice and on easy terms. A RARE OPPORTUNITY to embark in a business with little capital that promises great results, considering the low price of iron and cheapness of capital. Address for full particulars

J. ALBERT VAN WINKLE, Receiver,

P. O. Box 34, Paterson, N. J.

N. B.—Remnant of stock of material, consisting of shapes, bars, rivets, bolts, &c., is offered for sale. Stock list can be had on application to receiver.

**PITTSBURGH  
 SALES AGENCY,**

J. H. HILLMAN, Manager,

**No. 8 Wood St.,  
 Pittsburgh, Pa.,**  
 IS NOW ENGAGED IN THE

**Sale AND Reorganization**

**Manufacturing Plants,**  
 INCLUDING

Blast Furnaces, Rolling Mills, Machine Shops, Foundries, Agricultural Works, and Manufacturing Establishments Generally.

Dealers in Coal and Iron Lands.

Examinations and Reports  
 on Properties.  
 References on Application.

**FOR SALE OR LEASE.**

New York City Rolling Mill, foot of East 23d street. Modern plant, consisting of three high 18 in. Muck Mill and 10 in. Finishing Mill, with Rolls to make 36 in. to 2 in. round or square, 9/16 in. to 3 in. flat, thick or thin sizes; two heating and one busheling or puddling furnace. Excellent location. Large trade in Merchant Bar and H. S. Iron, cheap scrap. Particulars and satisfactory reasons for disposing by personal interview only.

J. F. HANLEY,  
 502-506 East 23d St., New York.

**Auction Sale**

—OF—

**EMERY WHEELS**

AND

**EMERY WHEEL MACHINES, &c.**

At the factory premises of The Springfield Emery Wheel Co., on the corner of Water Street and South Avenue, in Bridgeport, Conn., the following property will be sold at auction on account of F. Miller & Co., on Wednesday, April 25, 1894, at two o'clock P. M.

2 Car Wheel Grinders (new), manufactured by

The Springfield Emery Wheel Co.

4 Knife Grinders (new), manufactured by The

Springfield Emery Wheel Co.

6 Tool Grinders (new), manufactured by The

Springfield Emery Wheel Co.

8000 (about) Emery Wheels of various sizes

(new), manufactured by The Springfield

Emery Wheel Co.

90,000 lbs. (about) assorted castings of parts of

Emery Wheel Grinding Machines, manu-

factured by The Springfield Emery Wheel

Co.

Assortment of second-hand Knife Grinders and

Tool Grinders, manufactured by The Spring-

field Emery Wheel Co.

10 tons (about) Graded Emery.

**THE SPRINGFIELD EMERY WHEEL CO.****AUCTION SALE.****I. A. ISAACS, Auctioneer,**

Office, 36 Beekman St.,

Will sell all the valuable Machinery and Stock  
of the well-known Factory of

**The Schlichting & Smith Co.,**

Formerly New York Screw Top Works.

187 Pearl Street, Brooklyn,

3 Blocks from Brooklyn Bridge.

Thursday and Friday, April 26th, and 27th.

Consisting of Engine Lathes, Shapers, Milling,  
Drilling and Polishing Machines, Power Presses,  
Drop Hammers, Forges, Spinning Lathes,  
Blowers, Exhaust Blowers, Dies, Chucks, &c.

The above used in the manufacture of Sheet  
Metal goods, also Jewelers' Dies, Work Benches,  
Polishing Exhaust Plating Dynamo and com-  
plete Plating Outfit.

Boiler and Engine, 40 Horse-Power. Building  
to let. Four Story and Basement, 25 x 92. By  
order of

JULIUS SMITH, Receiver.

**RELAYING RAILS  
FOR SALE.**

I have on hand and for sale about 500 tons  
of 35 lb. Tee Iron Second-hand Rails with  
splices. Only used a short time and in an  
excellent condition to relay. For prices ad-  
dress

W. F. BRONSON,  
Painted Post, N. Y.**THE CLEASON-  
BRANSON BICYCLE.**To the readers of *The Iron Age*.

The bicycles which have been made embodying  
this invention have given every satisfaction  
and I feel certain that no live maker can dis-  
pense with the modern principle found in this  
invention, as it has been proved that no ROAD-  
STER is perfect without it. Several first-class  
manufacturers want to use this invention and  
later you may hear from them through *The Iron Age* and other first-class Journals, as I  
feel like letting all our first-class manufacturers  
have license to use this invention.

Yours, etc., JOHN BRANSON,  
2221 N. Front St., Philadelphia.**Trustee's Sale of Machine Shop Equipment.**

1 Lathes, 62 in. swing, 41 ft. bed; 30 in. swing, 22 ft.  
bed. One Pit Lathe. Drills, 36 in. upright, 5 ft. post  
drill. Horizontal Drilling Machine. Engines, 5 new  
and 7 second-hand, from 100 H. P. down. Cranes, 15  
ton G. Crane, 30 ft. high; 12 ton G. 18 ft. high.  
Building, extra heavy timbered, 70 ft. span, 100 ft.  
long, fit to remove, two storied, iron clad. Hundreds  
of Iron Pulleys and Fly Wheels, Hangers and Shafting.  
Address W. A. BOLE, Trustee,

Liberty Ave., cor. 25th St., Pittsburgh, Pa.

**A DOUBLE CUTTING****Paper Roll Cutter.**

Patent just issued and for sale. Cuts the  
Paper both ways. Adjustable to any width.  
Paper. Requires no rod to hang roll in cutter.  
Made partly of wood and iron or all iron.  
Copy of Patent sent on application. Address

THOMAS GASKINS,  
Arcadia, DeSoto Co., Florida.**WANTED,**

to make arrangement with

**Railroad and Machinist  
SUPPLY HOUSES  
AND DEALERS IN  
HEAVY HARDWARE**

to sell a new

**CHAIN BLOCK.**

This block is the best in the market and  
outclassed all others. Only wrought iron, steel  
and gun metal used in its construction. Ad-  
dress "CHAIN BLOCK,"

office of *The Iron Age*, 98-102 Reade St., N. Y.**A FINE CHANCE**

to invest in a splendid Hardware business in the  
finest little city in the West. Stock clean and  
neat, consists of Hardware, Stoves, Crockery  
and a general line of House furnishing goods.  
A change upward in prices will soon take place,  
therefore, now is "the time to invest." Ad-  
dress "FINE CHANCE,"

office of *The Iron Age*, 98-102 Reade St., N. Y.

**A N OLD ESTABLISHED** hardware house in  
A New York, whose salesmen cover the entire  
United States, wants the sole agency of Ameri-  
can manufacturers of Chains, Toilet Clippers,  
Locks, Files, Carpenters' Tools and similar  
articles. Address

"W. B. G." No. 105,

office of *The Iron Age*, 98-102 Reade St., New  
York.**TO MANUFACTURERS  
AND IMPORTERS.**

A man of energy and business qualifications,  
who has been in the hotel business for twenty  
years, intends establishing, in a live and grow-  
ing city of over 100,000 inhabitants, an agency  
for several lines of trade which will not con-  
flict. To this end he solicits correspondence  
from Manufacturers, Importers and jobbers.  
Satisfactory references and if business re-  
quires bond will be given. Please address

W. F. TOWNSEND,  
P. O. Box 183, Syracuse, N. Y.**TO RENT**

In Center of Hardware District.

On May 1, 1894, I will remove to 88 Chambers  
Street and will rent part of store and basement  
and entire sub-cell. Front of store will be  
entirely remodeled and improved. Immediate  
possession if desired. Apply to

R. CHRISTENSEN,  
90 Chambers St., N. Y.**TO LET.**

Store on the principal hardware street in  
New York, with or without fixtures. Or a  
portion of the same.

19 WARREN STREET.

**THE**Very Desirable Second Loft  
No. 99 CHAMBERS STREET,  
CORNER OF CHURCH, 25 X 100 FEET,**TO RENT,**

from May 1st. Light and airy. Entrance on  
Chambers Street, with steam elevator on Church  
Street.

THE AMERICAN WRINGER CO.

**FOR SALE.**

Entire plant of the Union Saw Co., including  
all machinery, tempering furnaces, etc., neces-  
sary for the manufacture of hand saws, etc.  
or advertiser will consider proposition of part-  
nership. Address

2024 S. Sixteenth St., Phila., Pa.

**A RARE CHANCE**

to secure an established Machine Tool business  
in New England, with a good supply of orders,  
is offered by the advertiser, who must give  
preference to other interests. Tools, stock,  
etc., will be sold at a bargain.

Address

"E.,"

office of *The Iron Age*, 146 Franklin Street,  
Boston, Mass.**An old established**

manufacturing company employing several  
travelers that visit the Jobbing Hardware trade  
in the United States and Canada, would like  
to arrange to sell one or two lines of specialties  
in connection with their present line.

"ENTERPRISE,"  
office of *The Iron Age*, 98-102 Reade St., N. Y.

**TO LET.**

Premises recently occupied by the Reading  
Hardware Company, fronting on Reade Street,  
with sign privilege and egress and ingress from  
Chambers street. A desirable location, fitted  
completely with shelving, gas fixtures, etc.  
Ready for occupancy May 1, 1894. For terms  
and particulars apply to

J. C. McCARTY &amp; CO.,

97 Chambers St., N. Y.

**ASSIGNEE'S SALE**

—OF—

**HARDWARE BUSINESS**

In the growing city of Fitchburg, Mass., the  
old established Hardware business of A. B.  
Lawrence & Co. A rare opportunity. Stock  
\$20,000 to \$25,000. Address

JOSIAH E. BACON, Assignee,  
107 Oliver St., Boston, Mass.

EUGENE BISSELL, Auctioneer.  
**E. BISSELL, SON & CO.,**

Successors to  
HAYDOCK & BISSELL,  
WHOLESALE

**HARDWARE AUCTIONEERS,**  
19 Murray St. and 15 Park Place, N. Y.  
Sales held weekly for the trade. Consignments sol-  
lited. We refer to the leading manufacturers and im-  
porters.

**FOR SALE.**

Well established Iron Foundry with complete  
stock of Patterns for Plumbers' Goods and for  
other castings. Present owner wishes to retire  
on account of other business, but will remain  
heaviest consumer. Terms easy. Splendid  
opportunity for enterprising party. Address

"FOUNDRY,"

office of *The Iron Age*, 220 S. 4th St., Phila., Pa.

**Collections?**

ATTENTION! Merchants and Manufactur-  
ers.—We collect your past due accounts. Do  
not let them remain too long upon your books.  
Send for our draft book.

**THE HARDWARE BOARD OF TRADE, Ltd.,**  
4 and 6 Warren street, New York.  
JAS. H. GOLDEY, Treas.

**A GOOD BUSINESS FOR SALE.**

For settlement of an estate, it is necessary to  
dispose of a well established and profitable job-  
bing and retail business in the hardware, plumb-  
ing and machinery line, located in Albuquerque,  
New Mexico. Goods sold all over Central New  
Mexico and Northern Arizona. Full informa-  
tion and references furnished by mail, and busi-  
ness and books open to personal examination.  
Location the best in the United States for in-  
valids suffering from pulmonary trouble. Ad-  
dress Lock Box No. 558, Albuquerque, N. M.

**New York Representative**

With ample facilities for carrying stock, long  
experience and a location in the center of the  
hardware district, I desire to represent in  
New York and surrounding territory, on salary  
or commission, manufacturer of goods for the  
hardware trade.

R. CHRISTENSEN,  
88 Chambers St., N. Y.

**LUXURY ON WHEELS.**

Solid through trains between Cincinnati,  
Toledo and Detroit. Pullman Vestibuled  
Trains between Cincinnati, Indianapolis  
and Chicago. Through car lines from  
Cincinnati via Indianapolis to St. Louis;  
also Cincinnati via Indianapolis to Dec-  
atur, Springfield, Ills., and Keokuk.  
These are the only lines running Pull-  
man Vestibule and Dining Cars between  
the cities named. See that your ticket  
reads via Cincinnati, Hamilton and  
Dayton.

WM. M. GREENE, Gen'l Manager,  
D. G. EDWARDS, Gen'l Passenger Agent.  
Cincinnati, O

Hosted by Google

**Irondale Furnace Property and Iron Valley Standard Gauge Railroad, connecting with B. & O., and Rolling Stock For Sale.**

1310 acres, two veins of coal, one coking and one steam, veins five and six feet thick, seven million tons of coal. Iron ore, fire clay, natural gas, ore and coal mines open, coking ovens. Modern furnaces with Whitwell stoves, dwelling houses, offices, etc. Seventy buildings. For further description of property apply W. N. HANEY, Supt., Independence, Preston Co., W. Va.

## SITUATIONS WANTED.

*Undisplayed Advertisements for Situations Wanted not exceeding fifty words Fifty Cents each insertion. Additional words one cent each.*

**BY SHEET IRON SALESMAN**; controls large Eastern trade on Galvanized and Black Sheets. "B. B." Box 419, office of *The Iron Age*, 96-102 Reade St., New York.

**BUYER'S POSITION** Wanted by high class man; must be with large concern; export or otherwise. Address "H. & I.", No. 419, office of *The Iron Age*, 96-102 Reade St., New York.

**MECHANICAL ENGINEER**, 29, with seven years' practical experience in machine shop, drawing office and assistant to superintendent, is open to engagement; speaks German and Scandinavian languages. Address "O. E. SCH.", 261 Clinton St., Brooklyn, New York.

**A MEMBER** of the American Society of Mechanical Engineers, at present manager and general superintendent of a large machine shop and foundry, desires to change his location; any manufacturer, of machinery or steam plants who needs a man of solid experience ought to address "EARLE," office of *The Iron Age*, 22-24 Pickering Building, Cincinnati, O.

**A ROLLER** on small mill; by a man of 15 years' experience; is thoroughly posted in all kinds of guide mill work; is also experienced in structural shape iron; is strictly temperate; can give best references. "ROLLER," No. 419, office of *The Iron Age*, 96-102 Reade St., N. Y.

**BY experienced mechanic as superintendent** of manufacture making locks and builders' hardware a specialty; 15 years' experience as superintendent; understands the business in all its branches; can handle men and material economically. Address "M. C.", No. 419, office of *The Iron Age*, 96-102 Reade St., N. Y.

**A foreman of iron foundry** by a thorough practical foundryman with six years' experience as foreman; can handle men and material in an economical manner. Address "H. J.", No. 419, office of *The Iron Age*, 96-102 Reade St., New York.

**AGENCY WANTED**.—Advertisers desire to represent manufacturer of first-class tool and other steels; have ample facilities for carrying stock and long established trade; would also like one Al side line. Address "J. & H.", Box 419, office of *The Iron Age*, 96-102 Reade St., N. Y.

**TO MANUFACTURERS OF BRASS GOODS**.—A gentleman well posted in the requirements of the plumbing trade desires a position as manager or general agent to represent a first-class house manufacturing fine sanitary specialties; have had 23 years' experience in the manufacture of this line of goods and can furnish considerable business to desirable parties. Address "SPECIALTIES," No. 419, office of *The Iron Age*, 96-102 Reade St., New York City.

**BY YOUNG MAN**; six years' experience in wholesale builders' hardware; desires position where by strict attention to business he can advance himself; first-class references given. Address "BUILDERS' HARDWARE," Box 412, office of *The Iron Age*, 96-102 Reade St., N. Y.

**BY A thorough Hardware Salesman**, experienced in store and on the road in all lines of general hardware, cutlery, guns, &c. made; builders' hardware and cutlery specialties. Address "EXPERIENCE," office of *The Iron Age*, 50 Dearborn St., Chicago.

**BY A HARDWAREMAN**; seventeen years' experience in builders' hardware, iron, steel, tinware, etc.; a man of family, good habits and health; wants position to represent on Pacific Coast Eastern manufacturer or wholesale house; well acquainted with part of the country and trade; willing to travel; responsible and can furnish bond. Address "J. W. A." care E. S. Adams, office of *The Iron Age*, 312 The Cuyahoga, Cleveland, Ohio.

**BY A HARDWAREMAN** of twenty years' experience; competent to take charge of a wholesale or retail business in any capacity; references of the highest. Address "YEARS' EXPERIENCE," office of *The Iron Age*, 96-102 Reade St., New York.

**A MECHANICAL ENGINEER** of wide knowledge and experience is at liberty for engagement; for further particulars address "WELL QUALIFIED," office of *The Iron Age*, 96-102 Reade St., New York.

**TO BRASS FOUNDERS**.—A thoroughly practical foreman molder, with large and varied experience, well up in melting and mixing of metals to suit every description of work; for years at the Delamater Iron Works, New York City; electrical work and copper castings a specialty; can give best of references; machinery jobbing shop preferred. Address "H. P. A." Citizens National Bank, Yonkers, N. Y.

**A N ACTIVE BUSINESS MAN**, with 15 years' practical experience in the management of iron properties, rolling mills, and manufacture of bars, shapes, sections, sheets and general merchant iron and steel, desires a position; can furnish best of references. Address "M. A. W." office of *The Iron Age*, 509-510 Hamilton Building, Pittsburgh, Pa.

**SELLING AGENCY WANTED**, for blast furnace and iron and steel works products, by a gentleman having extensive acquaintance among railroads, foundries and shops. Address "AGENT," No. 111, office of *The Iron Age*, 96-102 Reade St., New York.

**A MEMBER OF AMERICAN SOCIETY OF Mechanical Engineers**, who has had 20 years' practical experience as follows: machinist, head draughtsman, erector of steam plants, engineering, estimating, contracting and office work and superintendent of large engine works, is available for responsible position. Address "ENGINE WORKS," No. 16, office of *The Iron Age*, 96-102 Reade St., New York.

## HELP WANTED.

*Undisplayed Advertisements for Help Wanted not exceeding fifty words One Dollar each insertion. Additional words two cents each.*

**WANTED FOR CANADA**.—A man thoroughly conversant in manufacturing of all lines of Tacks, to take charge of shop in Canada. Reply P. O. Box 2091, Montreal.

**A YOUNG MAN** familiar with office work in pricing of invoices, etc., may address, with references, "IMPORTERS AND JOBBERS," office of *The Iron Age*, 96-102 Reade St., New York.

**A EXPERIENCED Traveling Salesman**, to travel mill, furnace and mine supplies and machinery; none but an experienced man need apply. Address "L. F. M." Box 488, Richmond, Virginia.

**A COMPETENT person** to take charge of the polishing and buffing room of a large brass finishing establishment; must be familiar with iron work also; first-class references required. Address "BRASS WORKER," office of *The Iron Age*, 96-102 Reade St., New York.

**A FOREMAN** to take charge of threading department of a bolt works. Address, giving age, experience and salary expected. "BOLTS," Box 419, office of *The Iron Age*, 96-102 Reade St., New York.

**EXPERIENCED man** as superintendent of mill making black plates for tinning. Address "BLACK PLATE," office of *The Iron Age*, 509-510 Hamilton Building, Pittsburgh, Pa.

**SALESMAN** calling on carriage manufacturers and jobbing or large retail carriage hardware trade West, South and East to handle line of excellent selling staple specialties, side line (commission), or resident responsible representatives in Chicago, Philadelphia, St Louis, New York, San Francisco and Boston who can reach tributary trade and do justice. "SALESMAN," Lock Box 1086, Philadelphia.

**NOW is the time to INVEST in SOUTHERN TIMBER- MINERAL LANDS,**

Before prices advance. All kinds of mines for sale.

**E. C. ROBERTSON,**  
Terms Easy. CINCINNATI. O. Titles Perpet

**KEEP BOOKS**

by WEST'S New Original-ENTRY LEDGER.

Make the same entry but once. A Ledger in place of a full set of books. Convenient forms for all entries. Easily applied, simple, saves time. West's Self-Proving Balance locates every error. Send 2-cent Stamps for illustrated 16-page pamphlet.

**WOLCOTT & WEST, Syracuse N. Y.**

## Art of

## Coppersmithing.

A Practical Treatise on Working Sheet Copper in all Forms.

By JOHN FULLER, Sr.

327 Pages, 474 Illustrations, 7 x 10 inches, Cloth. Price, \$3.00.

This work, prepared at great labor and expense, is reproduced from *The Metal Worker*, and forms an exhaustive treatise on the Coppersmiths' Art, being the only volume on that subject that has been published. It is beautifully illustrated with 474 pen and ink drawings, and is bound and printed in the best manner.

## CONTENTS:

Historical Sketch of Copper; Braziers' Art, or Light Coppersmithing; First Year's Experience; Repairing and Tinning; The Boy's Second Year; Making Washing Coppers; Making Small Brewing Coppers; Table of Dimensions and Capacity; Making Hand Bowls; Making Frying Pans; Making Closet Pans; Making Water Balls; Mounting for Copper Goods; Glue Pots and Tea-Kettles; Oval Tea-Kettles; Beer Mullers; Funnels; Coffee Pots; Saucepans and Pudding Pots; Stewpans; Stock Pots; Fish Kettles; Brazing Pans; Tea Boilers; Warming Pans; Preserving Pans; Dripping Pans; Coal Scoops and Coal Hods; Making Coal Scoops; Planishing and Smoothing; Cranes or Siphons; Pumps; Appliances of Railway and Marine Coppersmiths; Making Copper Pipe; Piecing and Joining Pipes; The Fire Pots; Fire Pot Set for Brazing Joint; Soft Soldering Large Joints; Taking Templates; Filling and Bending; Making Bends; Template Boards; Patching Pipes; Outlets; Expansion Joints; Tee Pieces; Three-way Pieces; Cross or Four-way Pieces; Saddle Fire; Marine Work; View of Maudsley, Sons & Field's Shop; Making Large Bends; Making Double Bends; Brazing on Flanges; Short Bends; Air Pipes for Ships; Making Hollow Spheres; Brazing Sheet Brass; Locomotive Brass Work; Brass Dome Covers; Heavy Pipes for Breweries; Brewing Coppers or Kettles; Dome Coppers; Dome and Pan Coppers; Tallow Coppers; Dyers' Coppers; Sugar Tieches; Stills.

Sent, postpaid, on receipt of price by

**DAVID WILLIAMS,**

Publisher,

96-102 Reade St., NEW YORK.

BONNELL'S NUBIAN BONNELL'S NUBIAN BONNELL'S NUBIAN BONNELL'S NUBIAN BONNELL'S NUBIAN BONNELL'S NUBIAN

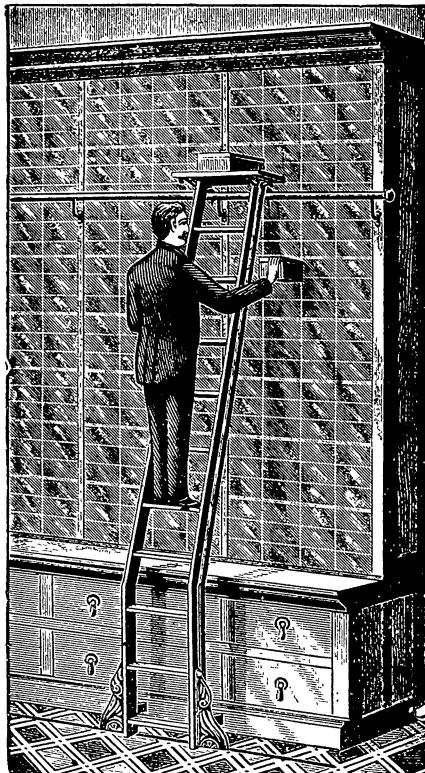
**\$100**

Per thousand words is what Robt. Louis Stevenson gets for his stories. The difference twixt Bob and us is that we pay more than that to *The Iron Age* for the privilege of writing; but there is method in this extravagance, it all comes back. Have we ever had anything from you? Do you know that BONNELL'S NUBIAN IRON ENAMEL is the best black on earth for all Iron Work? Write us just a postal card and get our story and the next issue of our quarterly calendar.

77 Warren St., New York, N. Y.  
Hall & Carpenter, Philadelphia.  
Taylor Goodrich, San Francisco.

THE NUBIAN IRON ENAMEL CO., 33-35 Nubian Ave., CRAGIN, ILL.

BONNELL'S NUBIAN BONNELL'S NUBIAN BONNELL'S NUBIAN BONNELL'S NUBIAN BONNELL'S NUBIAN



#### FLOOR TRACK BICYCLE LADDER.

Highest Award Columbian Exposition.  
No other Ladder Service can approach the "Bicycle" in ease and convenience of operation. Compared with others they work like a bicycle beside a lumber wagon.

Can be applied to any kind of shelving made.

See this space next week for other styles.

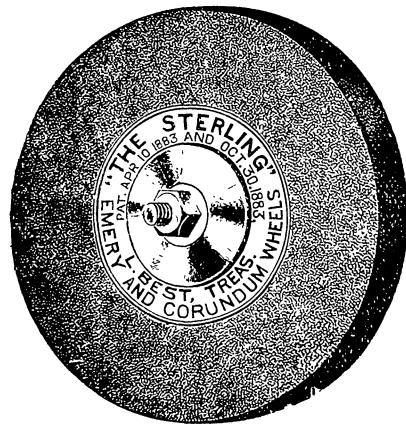
Send for Illustrated Catalogue and prices to

THE BICYCLE STEP LADDER CO.,  
50 State street, Chicago, Ill.

Sterling Emery Wheel Company, 174 Fulton St., N. Y.

FACTORIES:

Tiffin, Ohio, and West Sterling, Mass.



The Scattergood  
Time Record and  
Pay Roll Book.  
(Pat. Oct. 13, 1891.)

Address for Circular to  
HENRY W. SCATTERGOOD,  
23 Richmond St., Phila., Pa.

Saves  
Rewriting  
Names.

#### FOR NUMBERING AND LABELING Boxes, Drawers and Shelves

In Hardware Stores and Factories.

Send for sample and description of our Handy Box of small gummed Letters and Figures, intended for labeling shelf boxes. Put up especially for the Hardware trade.

THE TABLET AND TICKET CO., Mfrs.,  
57-59 Franklin St. 99 Franklin St.,  
Chicago. New York.

**WILLSON'S  
PAPER  
LETTERS**

## YOU CAN TIN CAST IRON

By the Flanders process, now in use by some of the largest firms in the country. Correspondence solicited for the erection of galvanizing or tinning plants and WELDED GALVANIZING KETTLES.

THOS. SANDS, - - - - Nashua N. H.

## THE LATEST BOOKS.

**Art of Coppersmithing.** By JOHN FULLER, Sr. A Practical Treatise on Working Sheet Copper in all Forms. This work, prepared at great labor and expense, is reproduced from *The Metal Worker*, and forms an exhaustive treatise on the Coppersmith's Art, being the only volume on that subject that has been published. It is beautifully illustrated with 474 pen and ink drawings, and is bound and printed in the best manner. 327 pages, 474 illustrations, 7 x 10 inches, cloth.....\$3.00

**Concrete, Its Nature and Uses.** By GEORGE L. SUTCLIFFE. A Book for Architects, Builders, Contractors and Clerks of Works. 8vo, cloth, illustrated.....\$3.00

**The Modern American Pistol and Revolver.** By RALPH GREENWOOD (A. G. GOULD). Entirely new edition. Very fully illustrated. 8vo, cloth.....\$1.50

**A Text-Book on Gas, Oil and Air Engines; or Internal Combustion Motors without Boiler.** By B. DONKIN. 130 illustrations, 434 pages, 8vo, cloth.....\$3.40

**A Treatise on the Kinetic Theory of Gases.** By H. W. WATSON. Second edition, revised and enlarged. 12mo, cloth.....\$1.00

**Engineering Drawing and Design.** By S. H. WELLS. A Manual for Technical Schools and Colleges, with numerous illustrations prepared expressly for the work. Part I.—Practical Geometry, Plane and Solid. Part II.—Machine and Engine Drawing and Design. 2 vols, 8vo, cloth.....\$2.50

**Lamp Primer, or Lamp Light and Lamps, and How to Care for Them.** By JOHN JONES-BURY. 12mo, flexible cloth .. ..\$0.50

**The Theoretical Elements of Electro-Dynamic Machinery.** By A. E. KENNELLY. 8vo, cloth.....\$1.50

**The Illustrated Architectural, Engineering and Mechanical Drawing-book.** By R. S. BURN. For the use of school students and artisans. Tenth edition. 160 pages, 8vo, cloth.....\$1.00

**Machine Construction and Mechanical Drawing.** By T. CRYER and H. G. JORDAN. Fifth edition, revised and enlarged. 4to, cloth.....\$1.20

**The Electric Transformation of Power and its Application by the Electric Motor, including Electric Railway Construction.** By PHILIP ATKINSON. Illustrated. 12mo, cloth.....\$2.00

**Helical Gears.** A practical Treatise. By a Foreman Pattern-maker, author of "Pattern-making," "The Principles of Fitting," etc. Illustrated with 100 engravings and frontispiece. 12mo, cloth, 127 pp.....\$2.00

**A Manual of Practical Assaying.** By H. VAN F. FURMAN, E.M. 8vo, cloth .. ..\$0.50

**Pigments, Paint and Painting.** By GEORGE TERRY. A Practical book for Practical Men. 12mo, cloth, 392 pp. Illustrated.....\$3.00

**Depreciation of Factories, Mines and Industrial Undertakings and their Valuation.** By EWING MATHESON. Second edition. 143 pages, 8vo, cloth.....\$3.00

**Notes on Cylinder Bridge Piers and the Well System of Foundations.** By JOHN NEWMAN. Especially written to assist those engaged in the construction of Bridges, Quays, Docks, River Walls, Weirs, &c. 136 pages, 8vo, cloth.....\$2.50

**Metal Working for Amateurs.** Edited by FRANCIS CHILTON YOUNG. In 3 parts. Part 1, Brazing and Soldering, by G. EDWINSON. Part 2, Practical Gas Fitting, by E. W. DENNIS. Part 3, Brass Casting at Home, by F. J. DURRANCE. Illustrated with numerous diagrams, explanatory sketches and working drawings. 110 pages, cloth.....\$0.40

**The Incandescent Lamp and Its Manufacture.** By G. S. RAM. 218 pages, 8vo, cloth.....\$3.00

**How to Wire Buildings.** By AUGUSTUS NOLL, E. E. A Manual of the Art of Interior Wiring. Cloth, 8vo. Illustrated. 162 pages.....\$1.50

**Notes on the Testing and Use of Hydraulic Cements.** By FRED. P. SPAULDING. NATURE AND PROPERTIES OF CEMENT. Definition; Portland Cement; Natural Cement; Slag Cement; Setting; Hardening; Adhesion; Soundness; Permanence of Volume. CEMENT TESTING. Object of Testing; Weight and Specific Gravity; Fineness; Rate of Setting; Tensile Strength; Ordinary Tests for Soundness; Accelerated Test for Soundness; Chemical Analysis; Compressive Tests; Adhesive Tests; Microscopic Examinations; Abrasive Tests; Air Slaking. THE USE OF CEMENT. Sand for Mortar; Water for Mortar; Mixing Mortar; Preparation of Concrete; Mixtures of Lime and Cement; Freezing of Mortar; Permeability of Mortar; Expansion and Contraction of Mortar; Retempering Mortar; Literature Relating to Cement. Cloth.....\$1.00

**Mining.** By A. LUPTON. An Elementary Treatise on the Getting of Minerals. 12mo, cloth.....\$3.60

**Benner's Prophecies of Future Ups and Downs in Prices;** what years to make money on Pig Iron, Hogs, Corn and Provisions. By SAMUEL BENNER, an Ohio Farmer. Ninth edition, with forecast for 1894. Cloth.....\$1.00

**Applied Mechanics,** specially arranged for the use of Students preparing for the Examinations of the Science and Art Department. By J. SPENCER. 8vo, cloth, pp. 252.....\$1.00

**Marine Boiler Management and Construction,** being a treatise on Boiler Troubles and Repairs, Corrosions, Fuels and Heat. On the Properties of Iron and Steel, on Boiler Mechanics, Workshop Practices and Boiler Design. By C. E. STROMEYER. 8vo, cloth.....\$5.00

**"The Iron Founder" Supplement.** By SIMON BOLLAND, Practical Moulder and Manager of Foundries; author of "The Iron Founder," &c. A complete illustrated Exposition of The Art of Casting in Iron. Illustrated with over two hundred engravings. 400 pages. 12mo, cloth.....\$2.50

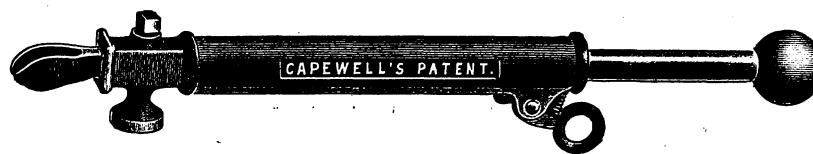
**A B C Five-figure Logarithms for General Use.** By C. J. WOODWARD. Containing mantissa of numbers to 10,000. Log. lines, tangents, cotangents and cosines to 10 seconds of arc. Together with full explanations and simple exercises showing use of the tables. Flexible leather cover and size convenient for the pocket.....\$1.00

Any Book Published Sent, Post-paid, on Receipt of the Price, by

DAVID WILLIAMS, Publisher and Bookseller,

96-102 Reade Street, New York.

# Two Heads Better Than One?



## Finest and Strongest Steel Jaw.

(Drop Forged and Interchangeable.)

Hard Tempered by New Process.

Does Not Batter.

"The Columbia."



Latest and Best.

Fine Steel, Warranted.

TRADE PRICES : PER DOZ.

Columbia Tack Puller,	\$1.50
Columbia Tack Puller and Hammer Combined,	2.00

Cash with Order. We Pay Express.

Specialty  
Manufacturing Co.,

HARTFORD, CONN.,

MANUFACTURE

*Columbia Nail Pullers,*

*Black Hawk Nail Pullers,*

*Hartford Nail Pullers,*

*"Boss" Barrel Openers.*

SEND FOR PRICE-LIST.

Certainly—**BARREL HEADS.** Save heads and hoops intact, and the EMPTY barrel is more useful, and can be sold for an increased price. That's plain, is it not? The "BOSS" BARREL OPENER is the first tool invented to easily and quickly pull nails out of barrel heads and hoops—quicker than a nail puller does out of boxes. Adapts itself to shape and "give" of a barrel. It fills the want of

Grocers, Bakers, Commission Merchants, and other dealers for just such a tool, and will be a "QUICK SELLER."

\$1.75, RETAIL PRICE

## THE INCOME TAX

has no such terror for the house-keeper as the outcome of tacks from a carpet.

## JOB'S PATIENCE

is needed when taking up carpets the old fashioned way.

## BUY

**The Columbia  
Tack Puller.**

IT SELLS QUICK.



The  
Piqua Handle  
& M'f'g Co.,  
Piqua, Ohio.

MAKERS OF  
Farming Tool Handles,  
Garden Rakes, "Piqua"  
Natural Wood Lock Furni-  
ture, Base Knobs, Elec-  
tric Push Buttons and  
Kindred Goods.  
Write for prices & cat.

# CRUCIBLE STEEL CASTINGS.

Why send your PATTERNS EAST and WAIT FOUR WEEKS for your CASTINGS when you can get

## SOLID STEEL CASTINGS

at home PROMPTLY? Answer

**THE KING & ANDREWS CO.,**

No. 218 N. Union Street, CHICAGO, ILLS.

E

## SPECIAL

And Automatic Machinery and Tools for reducing cost of manufacturing machines, parts of machines, articles of hardware, &c., designed and built. Tools, models and experimental work. Estimates given. Correspondence solicited.

**IDEAL MACHINE WORKS,**  
P. O. Box 655 Hartford, Conn.

## LOOK HERE

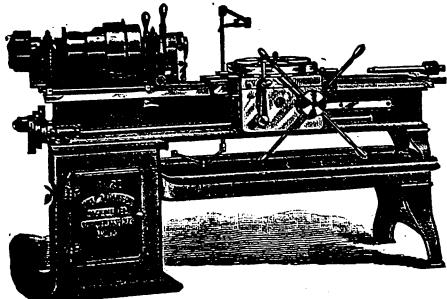
For Special Machinery. That is if you want square dealing and good work.

## OF COURSE

We make things besides machines. So write us about anything of metal you need.

**The L. E. Rhodes Co.,**  
Hartford, Conn.

HAVE YOU A  
**FLAT TURRET LATHE?**



If not send for

**RAPID LATHE WORK.**  
JONES & LAMSON MACHINE CO.,

SPRINGFIELD, VT., U. S. A.



MANUFACTURERS OF

**Improved Revolving Mining Screens,**

For Coal, Ores, Phosphates, Etc.

Also Tipple Screens and Yard Screens. Extra Heavy Double Crimped Mining Cloths, of every description.

W. S. TYLER, Pres. PROCTOR PATTERSON, Sec and Treas.

CLEVELAND, OHIO.

**LABORATORIES OF**

**DR. GIDEON E. MOORE,**  
221 Pearl St., New York.

DEPARTMENT OF CHEMISTRY. Analyses and Assays of Ores, Metals, Waters, Fuel, Oils and Natural and Industrial Products of every description.

DEPARTMENT OF PHYSICAL TESTS. Chas. F. McKenna, Director. Tensile, Transverse and Compression Tests of Iron, Steel and other Metals and Alloys, Cements, Building Stones and Engineering Materials generally. Tests of Lubricating Value of Oils, etc., etc.

PRINTED PRICE-LISTS ON APPLICATION.

**ALUMINUM.**

**The Pittsburgh Reduction Co.,**

116 Water St., Pittsburgh, Pa.,

Offer Aluminum guaranteed equal in purity to the best in the market, at lowest rates obtainable.

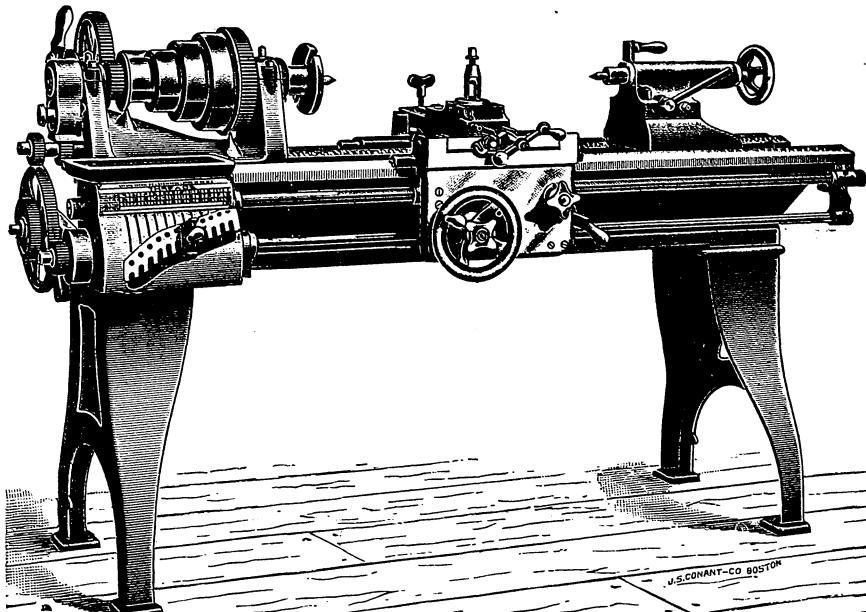
**ALUMINUM SHEET, WIRE,  
AND CASTINGS.**

**A TREATISE ON TOOTHED GEARING.**

Containing complete instructions for Designing, Drawing, and Constructing Spur Wheels, Bevel Wheels, Lantern Gear, Screw Gear, Worms, &c. and the proper formation of Tooth Profiles. For the use of Machinists, Pattern Makers, Draughtsmen, Designers, Scientific Schools, &c. With many plates. By J. Howard Cromwell. 12mo, cloth. \$1.50.

Sent, post-paid, on receipt of price by

DAVID WILLIAMS, Publisher and Bookseller,  
96-102 Beale Street, NEW YORK.



**The Hendey Machine Co., Torrington, Conn.**

**A NEW FEATURE IN SCREW CUTTING ENGINE LATHES. THE HENDEY-NORTON LATHE.**

This lathe cuts 12 different screws, from 6 to 20, without changing the gears, and feed changes from 36 to 120 cuts per inch without change. This cut shows a 14-inch x 6-foot Lathe. It has hollow spindle, 1-inch. Has compound or elevating rest, as preferred, or the double carriage rise and fall rest. Also taper attachment if desired. The carriage reverses for screw cutting without the use of the countershaft, from the lever at the end of carriage, allowing the spindle to run in one continuous direction. In stock for immediate delivery, 14-inch, 16-inch and 18-inch; 20-inch and 30-inch in the works. Send for descriptive catalogue.

CHAS. CHURCHILL, Ltd., London, England,  
SCHUCHARDT & SCHUTTE Berlin, Germany, **AGENTS.**  
EUGENE SOLLER, Basel, Switzerland,

**The Hendey Machine Co., - Torrington, Conn.**

**Do You BORE CYLINDERS?**

**THE HORIZONTAL BORING MACHINE**

Is a SPECIAL TOOL FOR THIS PURPOSE.

SEND FOR PARTICULARS TO

**NEWARK MACHINE TOOL WORKS,  
NEWARK, N. J.**

J. A. FAY & Co., CHICAGO, WESTERN AGENTS.

To

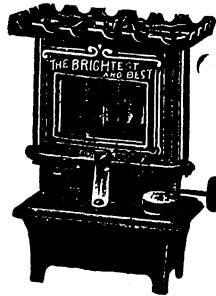


**Prove** that "the way to do it is to do it on the

Stearns," the riders of Stearns bicycles have already begun to win prizes on the racing track. The wheel that holds 14 world's records will keep to the fore.

**E. C. STEARNS & CO.,**  
Syracuse, N. Y.

# B. & B. Money Makers.



No. 01 B. & B. LAMP STOVE.

List Price, \$8.00 per dozen.  
Code word, *Garden*.  
Packed one dozen in box.  
Weight, 50 lbs.  
Height, 8½ inches. Size of Tank, 3½ x 5½ inches.  
NICKEL FRONT. Four-inch wick



No. 03 B. & B. LAMP STOVE.

List Price, \$24.00 per dozen.  
Code word, *Gauge*.  
Packed ½ dozen in box.  
Weight, 65 pounds.  
Height, 8½ inches.  
Size of Tank, 5½ x 8½ inches.  
NICKEL FRONT. Three 4-inch Wicks.

No. 02 B. & B. LAMP STOVE.

List Price, \$18.00 per dozen.  
Code word, *Garter*.  
Packed one dozen in box.  
Weight, 85 pounds.  
Height, 8½ inches.  
Size of Tank, 5½ x 5½.  
NICKEL FRONT. Two 4-inch wicks.

Our discounts will interest you. B. & B. Lamp Stoves, Ovens, Cook Stoves and Oil Heaters are up to the times. Our Prices are made to suit the times. Ask for our 80 page catalogue and be convinced.

**The Glazier Stove Co., Mfrs., CHELSEA, MICH.**

W. W. MONTAGUE & CO., San Francisco, General Agents for the Pacific Coast.



## WHITE MOUNTAIN FREEZERS.

**THE BEST FREEZER.** Heavy Waterproof Tubs. Cans of Charcoal Tin-plate. Malleable Iron Dashers. All inside parts tin-plated. Gearing completely covered. Inquire of any leading jobber or write us. **SELLER.** The White Mountain Freezer Co., Nashua, N. H.



The true test of a Freezer is how well it performs its work; in this respect the unsolicited testimony of thousands pronounce the "Packer Freezers" unexcelled.

**GOOD LUCK, STANDARD, AND CONFECTIONERS' MACHINE FREEZERS.**

The "Good Luck" is the latest and best low price Freezer on the market. Inside Castings Tinned, Malleable Iron Fittings, Automatic Scraper. White Cedar Pails with Galvanized Steel Hoops. Pine Pails, or Wire Rings with bottom of pail unprotected are not used.

CHAS. W. PACKER, Mfr., 20 N. Fourth St., Philadelphia.

THE WILLIAMS PRINTING CO.,

Commercial Printers AND Binders.

ESTIMATES FURNISHED FOR ALL CLASSES OF WORK.

96, 98, 100 and 102 READE STREET, - NEW YORK.

**ICE CREAM FREEZERS with ELECTRIC WELDED WIRE HOOP PAILS.**

This season we maintain our established reputation as leaders of all improvements in Ice Cream Freezers, and of making the best goods in the market. In adopting, for our entire line, the ELECTRIC WELDED WIRE HOOP PAILS, the hoops of which are twice as strong as the old flat hoops, and are guaranteed not to fall off, we have taken a step in advance of all others. All our pails are made of the Best Virginia White Cedar. All inside parts of Freezers are thoroughly coated with Pure Block Tin. Materials and workmanship are of the very best.

With the acquirement of the Freezer business of the Shepard Hardware Co., we have now the largest, best and most popular line of Freezers in the market. Prices Right.

DISCOUNTS QUOTED ON APPLICATION.

Manufactured by

**NORTH BROS. MFG. CO., PHILADELPHIA, PA.**

**COVERT'S SELF-LOCKING, GATE AND DOOR HOOK.**  
POSITIVELY PREVENTS BEING UNHOOKED FROM THE OPPOSITE SIDE THROUGH CRACK OR NARROW OPENING  
MADE IN TWO SIZES 4 AND 6 INCH XC PLATED.

**SAMPLE BY MAIL. 15¢**

Call for Our Banner Bolt Snap.

This snap has many important advantages over other makes of Bolt Snaps, viz.: It is lighter, the spring is entirely covered and protected from foreign substances and freezing, and is lower in price.

Made in all sizes; Round, Loop and Open Eye. We are headquarters and the most extensive manufacturers in Saddlery, Coach and General Hardware Specialties.

**Covert's Saddlery Works, FARMER, N. Y., U. S. A.**

**Hardware Dealers Can Profitably SELL BICYCLES.**

There is a large trade in Bicycles in all parts of the country and much of that trade naturally belongs to dealers in hardware. Good bicycles meet with a ready sale and pay a fair percentage of profit.

## COLUMBIAS

Are the representative high grade machines in America. A Columbia is the easiest machine to sell to the best trade because it is unquestionably the standard wheel of the world.

We want enterprising agents of good standing and solicit correspondence.

Pope Mfg. Co.,  
221 Columbus Ave.,  
Boston, Mass.

## INSTRUCTION BY MAIL

In Architecture, Architectural Drawing, Plumbing, Heating and Ventilation, Bridge Engineering, Railroad Engineering, Surveying and Mapping, Electrical Engineering, Mechanical Drawing, Mining, English Branches, and

### MECHANICS.

Diplomas awarded. To begin students need only know how to read and write. Send for FREE Circular of Information stating the subject you think of studying to THE CORRESPONDENCE SCHOOL OF MECHANICS AND INDUSTRIAL SCIENCES, Scranton, Pa.

**4000 STUDENTS.**



# REID DRILL CHUCKS.

## THREE SIZES.



No. 0 takes any drill from 0 to 1-2 inch inclusive.

No. 1 " " " " 0 " 3-4 " "

No. 2 " " " " 0 " 1 " "

They are the strongest and most durable made. Drill absolutely in the center. No twisting or bending necessary if drill is straight. Can be fitted to hollow spindle lathes for working long rods.

SEND FOR CIRCULAR.

R. H. BROWN & CO., - New Haven, Conn.

# ROLLER JACK SCREW.

You can't mix on the quality.  
We make only the best!



**Sand Papers** { Flint Paper  
Garnet Paper  
Emery Paper  
Emery Cloth  
Reams and Rolls

HAIR FELTING for covering Boilers, Steam and Water Pipe, and lining Refrigerators.

**BAEDER, ADAMSON & CO.**

730 MARKET STREET, PHILADELPHIA.  
67 BEEKMAN STREET, NEW YORK.  
143 MILK STREET, BOSTON.  
162 LAKE STREET, CHICAGO.



We have experimented much with ball bearing Jacks, and found them very satisfactory when not heavily loaded. Now, instead of balls we put in rollers, as seen in cut. These rollers will stand any load that the Jack will carry, and are not liable to get out of order. We have thoroughly tested these Roller Jacks with a spring balance and find a saving of forty per cent. of power needed to lift a given weight.

The price is about ten per cent. more for Roller Jacks, and the gain is 40 per cent. This ought to insure their sale as fast as the facts become known.

# MILLERS FALLS CO.,

93 READE STREET, - - - - - NEW YORK.

Palmer's Common Sense Frame Pulley.



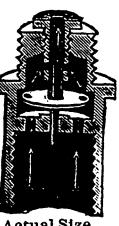
MANUFACTURED BY

PALMER HARDWARE MFG. CO., Troy, N. Y.

## "Economist" Gas Governor

GAS BILLS REDUCED 25 PER CENT.

Retails for 30 cents and gives large profit to agent. We place our governors on trial for 30 days and guarantee perfect satisfaction. Agents wanted in all cities and towns where gas is used. Write for circular and agents' price to



**The New York Gas Saving Co.,**

Decker Building, Union Square, N. Y.

## Closing Out Leading Lines of Tools.

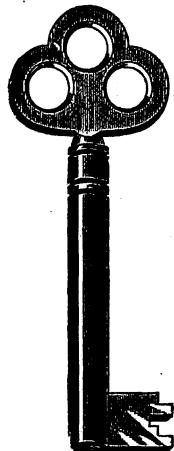
Starrett's, Stevens', Brown & Sharpe's, Chesterman's, Stub's, Grobet and other makes of Tools and Files, Moulders' Tools, Chucks, Drills and Reamers, Steel Rules, Squares, Calipers and Dividers, Brass Gears and Pinions. Call early while assortment is unbroken.

**THE FRASSE COMPANY, 19 Warren St., N. Y.**

P. O. BOX 879.

# CABINET LOCKS

OF EVERY KIND.



DRAWER LOCKS,  
CUPBOARD LOCKS,  
WARDROBE LOCKS,  
CHEST LOCKS,  
DESK LOCKS.



A complete line of more than 1000 list numbers exclusive of our old and complete line of

**YALE CABINET LOCKS.**

**THE YALE & TOWNE M'F'G CO.,**

STAMFORD, CONNECTICUT.

New York. Chicago. Philadelphia. Boston. Pittsburg. San Francisco.

## LePage's Liquid Glue



IS UNIVERSALLY CONCEDED TO BE  
**The BEST in the WORLD.**

Its Superior Quality has created for it an Established Demand, and it sells without effort and upon its merits

IT IS ALWAYS RELIABLE,

and the dealer who buys it is Not Experimenting.

**BEWARE OF IMITATIONS and SUBSTITUTES.**

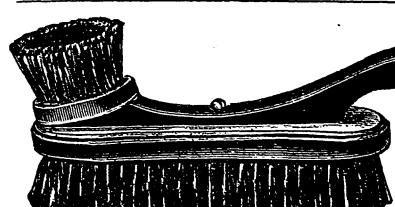
We can furnish original and attractive advertising matter for "LEPAGE'S GLUE" upon request.

SEND FOR CIRCULARS AND PRICE-LIST.

**RUSSIA CEMENT CO.,** Gloucester, Mass.

NEW YORK OFFICE, 95 Reade and 113 Chambers Streets.

PACIFIC COAST OFFICE, 23 Davis St., San Francisco, Cal.

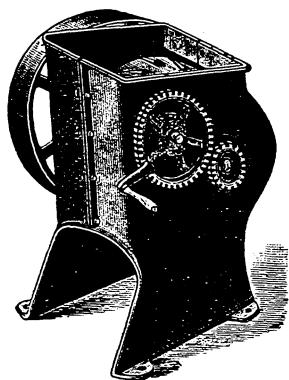


**Brushes** And  
Prices to suit the trade.

Our Handled Shoe Brushes are handsomely finished and very salable. —No nails.—Handles and Top Knots are screwed on.

THE BROMWELL BRUSH & WIRE GOODS CO.,

CINCINNATI, O.

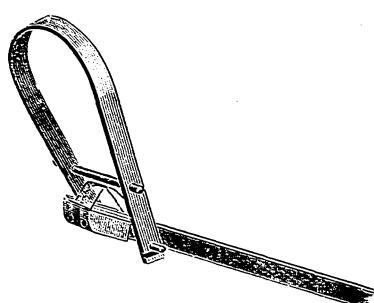


This cut represents our  
**RAPID ICE BREAKER**,  
combining several recent improvements as noted in  
our illustrated catalogue.

**CLEMENT & DUNBAR,**  
PHILADELPHIA.

**Improved American.**

PATENT PENDING.



**THE BISHOP POKES** are the best, as they are made from good material, are very strong, and have all the latest improvements up to date. Shun other pokes said to be just as good, for they are not. For names of Bishop Pokes we refer to price-list in *Iron Age*. They are for sale by nearly every jobber of hardware in the U. S.

**A. W. BISHOP,**  
MAKER,  
BEREA, OHIO.

# W. & B. DOUGLAS, MIDDLETOWN, CONN.

Branch Warehouses: 85 and 87 John St., New York; 197 Lake Street, Chicago, Ill.

THE OLDEST AND MOST EXTENSIVE MANUFACTURERS OF

## Pumps, Hydraulic Rams, Garden Engines,

Yard Hydrants, Street Washers, Galvanized Pump Chain, Wind Mill Pumps and other Hydraulic Machines in the World.

## DOUGLAS' DIAPHRAGM PUMPS, "Loud Patent."

A LARGE CAPACITY AND EASY WORKING PUMP FOR

Water Works, Sewer Contractors, Foundation Builders, Mines, Quarries,

Fig. 209.

Fig. 381.

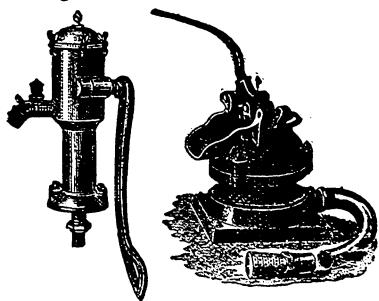
Fig. 145.

or wherever it is desired to raise a large quantity of water by  
hand power.

The pump has large valves (accessible by hand), and will pump water containing sand, gravel, sewage matter, &c., without choking or any perceptible wear.

### CAPACITY

from 3,000 to 4,500 gallons per hour.

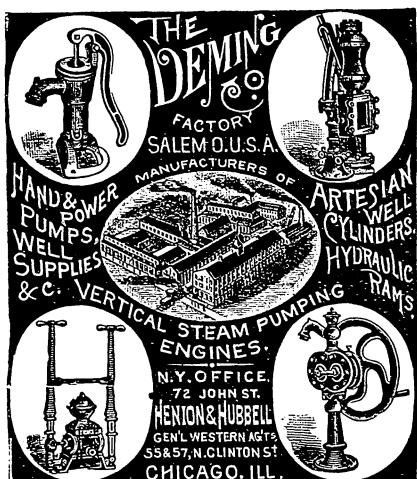


These pumps are simple, durable and low priced.  
Made either as shown in cut for Hose or for IRON Pipe Suction underneath.

Send for Circular and Price List.

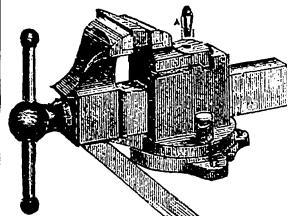


C. I. Grindstone Frame.

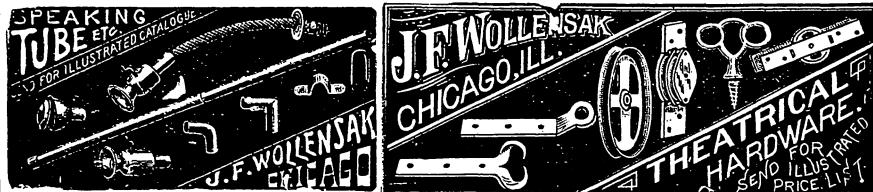
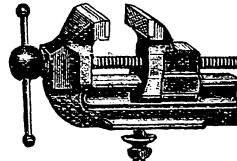


## PRENTISS' PAT. VISES.

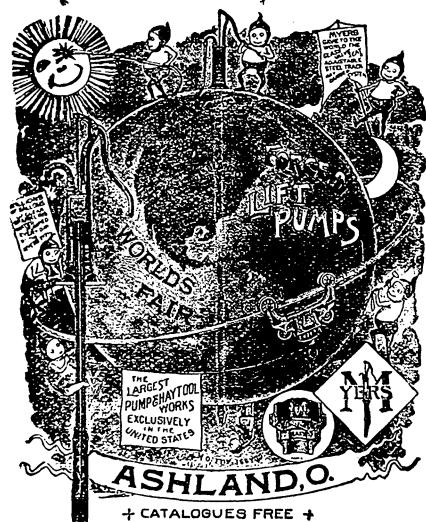
The Leaders for 20 Years



Send for Illustrated Catalogue  
of  
ALL KINDS OF VISES.  
PRENTISS VISE COMPANY,  
MANUFACTURERS,  
44 Barclay St., New York.



## F.E. MYERS & BRO.

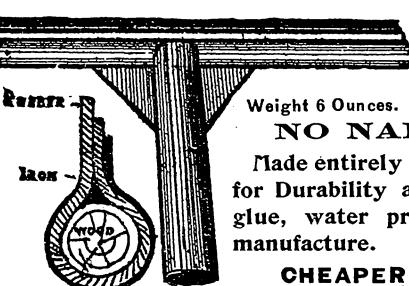


Ashland Pump and Hay Tool Works.

The New York Safety Dumb Waiter.  
"The Manhattan Dumb Waiter."  
"The Improved Humphrey Hand Elevator."  
Made specially to be sold by Hardware Stores.  
Thousands in use. Catalogues on application.

THE STORM MANUFACTURING CO.  
NEWARK, NEW JERSEY.  
Formerly of Poughkeepsie, New York.

Patented January 4th, 1887.



## BOURKE'S Nonpareil Window Cleaner.

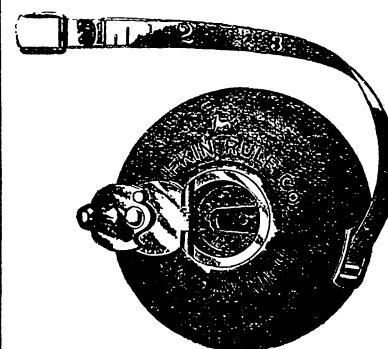
NO NAILS. NO SCREW.

Made entirely of Galvanized Iron and is Unexcelled for Durability and Simplicity of Construction. No glue, water proof cement or shellac used in its manufacture.

CHEAPER than the CHEAPEST,

BETTER than the BEST.

For prices on this and other specialties address THE BOURKE MANUFACTURING CO., Youngstown, O.



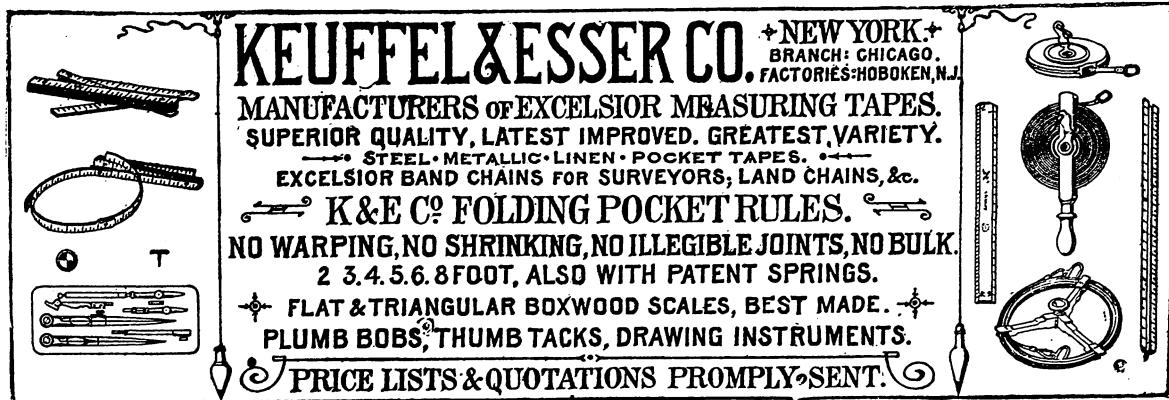
## "RELIABLE" Steel Measuring Tapes.

Entirely new. Handle or crank when closed is perfectly flush with leather case. Opens by pressing button on opposite side and folds out double, giving increased leverage. Best and most convenient steel tape on the market. Fully guaranteed. Will send samples on approval. We carry a complete stock of our goods at our New York Office, 20 Murray St.

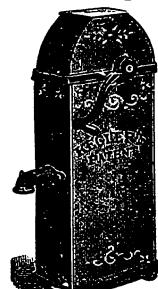
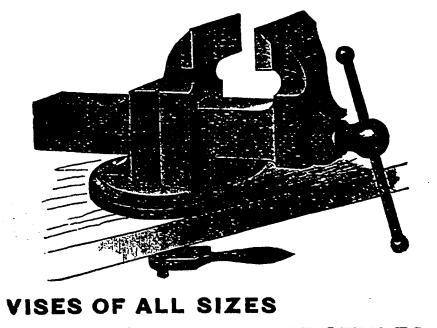
LUFKIN RULE CO., Saginaw, Mich.

**KEUFFEL & ESSER CO.** NEW YORK.  
BRANCH: CHICAGO.  
FACTORIES: HOBOKEN, N.J.

MANUFACTURERS OF EXCELSIOR MEASURING TAPES.  
SUPERIOR QUALITY, LATEST IMPROVED, GREATEST VARIETY.  
STEEL, METALLIC, LINEN, POCKET TAPES.  
EXCELSIOR BAND CHAINS FOR SURVEYORS, LAND CHAINS, &c.  
K & E C<sup>o</sup> FOLDING POCKET RULES.  
NO WARPING, NO SHRINKING, NO ILLEGIBLE JOINTS, NO BULK.  
2 3.4.5.6.8 FOOT, ALSO WITH PATENT SPRINGS.  
FLAT & TRIANGULAR BOXWOOD SCALES, BEST MADE.  
PLUMB BOBS, THUMB TACKS, DRAWING INSTRUMENTS.  
PRICE LISTS & QUOTATIONS PROMPLY SENT.



IRON INSTEAD OF WOOD.  
GALVANIZED IRON  
TUBING and CURB,  
FOR  
CHAIN PUMPS,  
(Kegler's Patent)  
Are Giving Universal Satisfaction,  
BECAUSE:  
They do not rust and  
accumulate filth—always  
clean. Extreme lightness is  
combined with strength and  
durability. No freezing.  
No waste of water by  
reason of enlarged reservoir  
at top of tubing. No  
annoying wheel at bottom.  
Easy to handle.  
Tubing weighs less than  
1/4 lb. per ft., is connected  
by couplings and can be  
attached to any make of  
curb.  
Send for Catalogue.  
Bellevue Pump Co., Bellevue, Iowa.

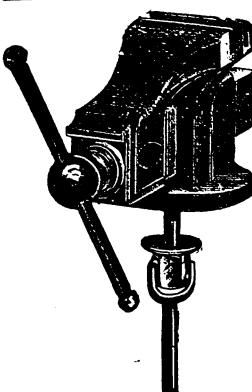



VISES OF ALL SIZES  
AND STYLES.

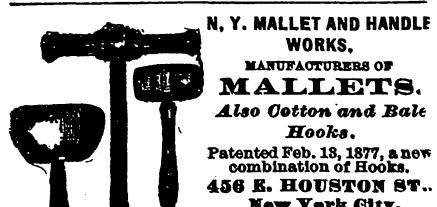
ATHOL MACHINE CO.,  
ATHOL, MASS., U. S. A.

SEND FOR CATALOG.

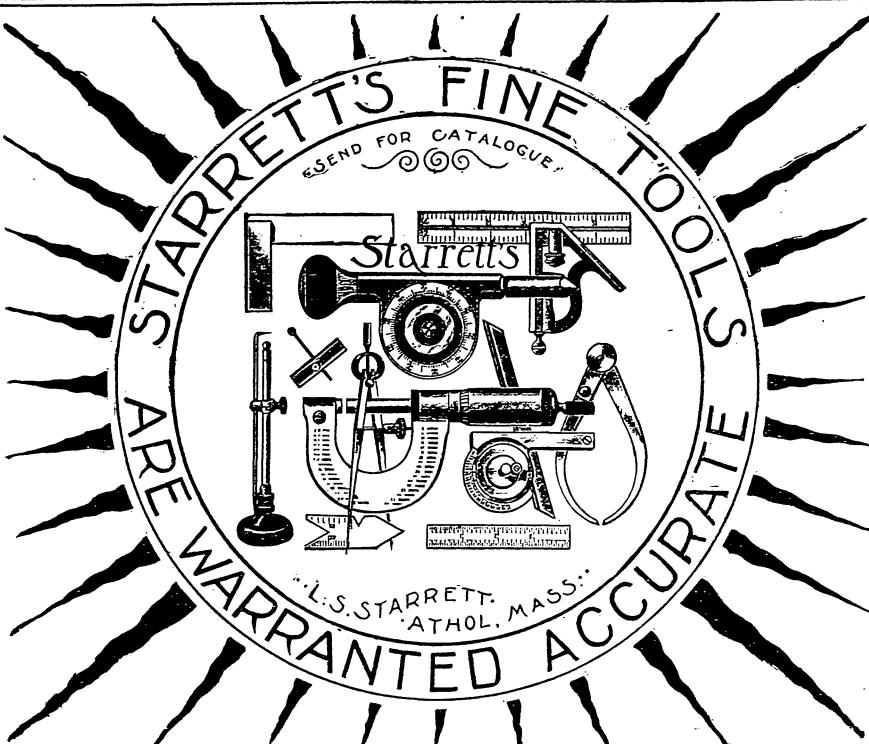
HOLLANDS'  
OFFSET JAW  
VISE.  
Specially adapted  
for drill press work  
where chucks can  
not be used and  
equally good for  
special or regular  
bench work.  
Hollands Mfg. Co.  
ERIE, PA.,  
Manufacturers all  
styles VISES.



N. Y. MALLETS AND HANDLE  
WORKS.  
MANUFACTURERS OF  
MALLETS.  
Also Cotton and Bale  
Hooks.  
Patented Feb. 18, 1877, a new  
combination of Hooks.  
456 E. HOUSTON ST.  
New York City.



STARRETT'S FINE TOOLS  
ARE WARRANTED ACCURATE  
"L. S. STARRETT,  
ATHOL, MASS."  
SEND FOR CATALOGUE



FOR SALE AT MANUFACTURER'S PRICES!  
Marston's Hand & Foot Power Mach'y  
FOR SALE BY  
A. J. Wilkinson & Co., 180-88 Wash. St., Boston, Mass.



Marston's Hand & Foot Power Mach'y  
FOR SALE BY  
A. J. Wilkinson & Co., 180-88 Wash. St., Boston, Mass.

W. R. OSTRANDER & CO.,  
204 FULTON STREET, NEW YORK,  
Manufacturers of  
SPEAKING TUBES, WHISTLES, ORAL, ELECTRIC  
MECHANICAL AND PNEUMATIC ANNUNCIATORS  
AND BELLS.  
Complete outfit of Speaking Tubes, Whistles  
Electric, Mechanical and Pneumatic Bells. A full line  
always in stock. Send for new catalogue. Factory,  
DeKalb Ave. near Knickerbocker, Brooklyn, N. Y.



GEO. N. CLEMSON, PRES.

S. S. BATTIN, Vice-Pres.

ROBERT J. JOHNSON, Treas.

F. B. EARLE, Sec.

# THE NATIONAL SAW CO.,

OPERATING

Wheeler, Madden & Clemson Mfg Co., Woodrough & McParlin, Richardson Brothers, Harvey W. Peace Co., Monhagen Steel Works, Woodrough & Clemson, Pennsylvania Saw Co.

SEND FOR PRICE-LIST.

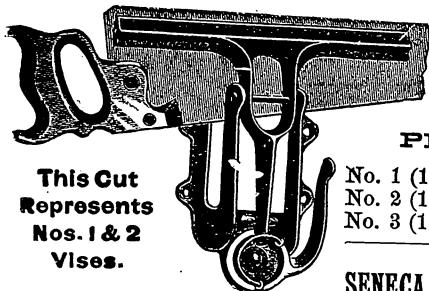
GENERAL OFFICE :

NEWARK, - - New Jersey,

# SAWS

## WENTWORTH'S PATENT NOISELESS SAW VISES,

WITH RUBBER CUSHIONED JAWS.



This Cut  
Represents  
Nos. 1 &  
2  
Vises.

Prevent all vibration and render Saw Filing noiseless.  
Will make no more noise than Filing on a Solid Piece of Iron.

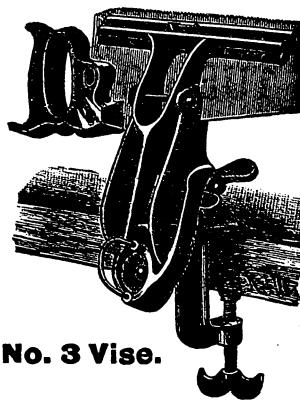
Have a Larger Sale than All Other Kinds Combined.

## PRICE LIST.

	PER DOZ.
No. 1 (11 inch Jaws),	\$15.00
No. 2 (15 inch Jaws),	21.00
No. 3 (11 inch Jaws),	18.00

LIBERAL DISCOUNT TO THE TRADE.  
LONGEST JAWS, HEAVIEST AND  
BEST FINISHED.  
Sold by all leading jobbers of general  
Hardware at Factory Prices.

—MANUFACTURED BY—  
SENECA FALLS MFG. CO., 255 Water St., Seneca Falls, N. Y.



No. 3 Vise.

THE KNAPP & COWLES MFG. CO.,  
BRIDGEPORT, CONN.

Makers of a large line of  
STANDARD

Hardware Specialties.

SEND FOR  
K Catalogue.

WM. KROGSRUD,  
Engraver and Die Sinker,  
61 Fulton St., N. Y.  
Manufacturer of  
STEEL STAMPS  
For Every Purpose.  
Steel Letters and Figures.  
Burning Brands, Stencils,  
&c. Send for Illustrated  
Catalogue.



3 NICKLE, Silver and Bronze Metallic Figures and Letters. Sizes  $\frac{1}{4}$  in to 3 in. Pattern Letters, Steel Stamps, Brands Dies &c. Send for Reduced Price List. We take a specialty of the Hardware Trade. A. A. WHITE & CO., Providence, R. I.

**IT PAYS.** Nothing about a Hardware Store looks so well as clean shelves and the goods neatly boxed with a fresh sample on the front. Customers are attracted by such a display of care, and notice and buy things that would ordinarily go without notice. The Boxes are inexpensive, save the goods, make a big show for a small investment and help the salesmen. Send to JESSE JONES & CO., 615 and 617 Commerce St., Phila., Pa., for Catalogue of prices, styles, and references.

ARCHITECTS' &amp; CARPENTERS' TRANSIT,

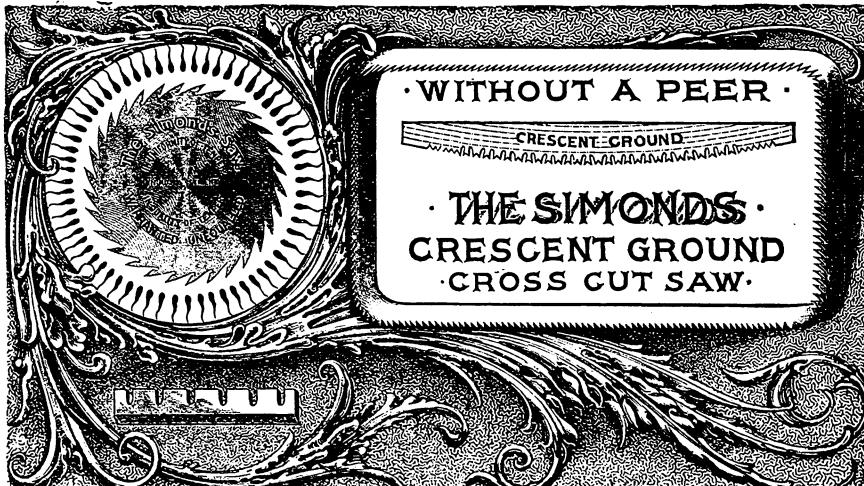


SEND FOR

PRICES



O. F. RICHARDSON & SON, Athol, Mass.  
Manufacturers of Iron Levels  
and Leveling Instruments.



Simonds Mfg. Co. Simonds Saw Co.  
FITCHBURG, MASS. CHICAGO, ILL. SANFRANCISCO CAL. PORTLAND, ORE.

## The Taintor Positive Saw Set

Mechanics are now inquiring for this tool, and Hardware Dealers should have them in stock, or at least have a sample.

For Prices and Discounts, address

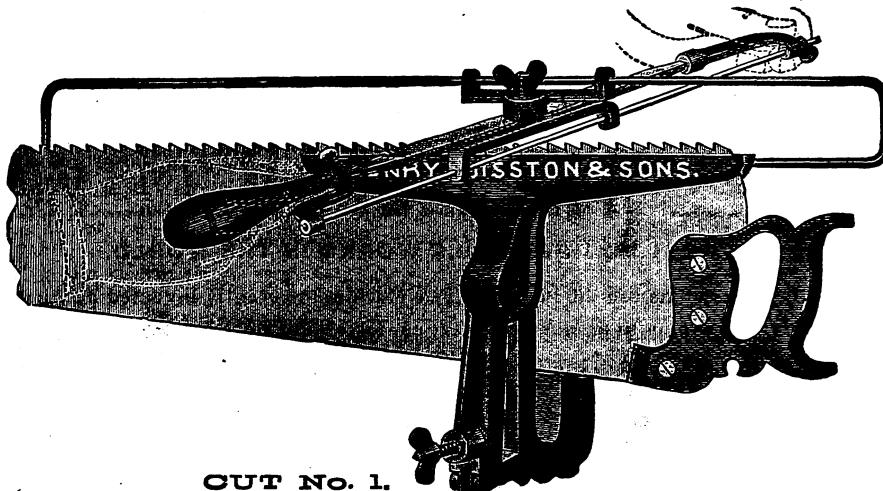
WIEBUSCH & HILGER, LTD., SOLE AGENTS,  
84 and 86 Chambers Street,

NEW YORK.



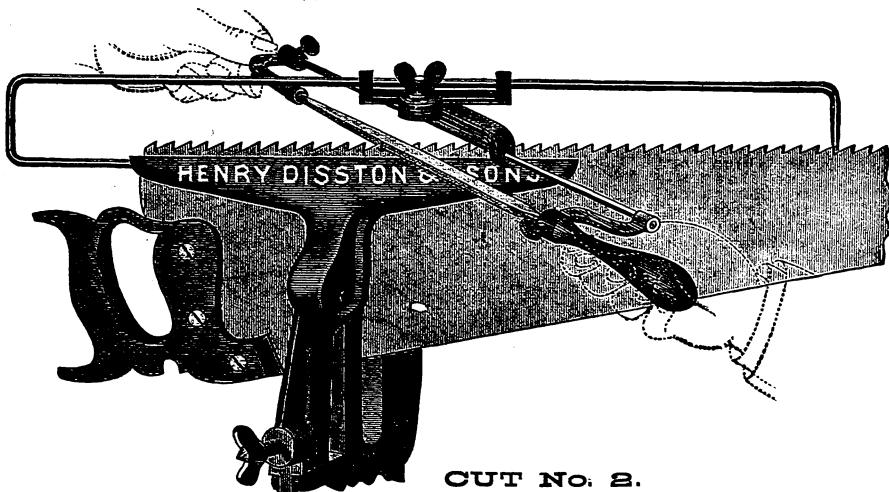
# DISSTON'S Improved Saw Clamp AND FILING GUIDE.

ESPECIALLY DESIGNED TO ASSIST THOSE NOT SKILLED IN THE ART  
OF SAW FILING TO FILE A SAW CORRECTLY.



CUT NO. 1.

Cut No. 1 shows a saw and the attachment in proper position for filing the first side; and Cut No. 2 shows the saw and attachment reversed and in position to file the second side. There are three marks on one of the hubs of the swivel attachment, and one mark on the other. One of the three marks shows when it is in position No. 1, and the other designates when it is in position as shown in No. 2. The third, or centre, marks show when it is in position for filing Rip Saws.



CUT NO. 2.

To obtain the correct position, loosen the wing nut and move the guide around to the point desired; after tightening wing nut, loosen screw in file handle, then turn handle until file gives the shape tooth wanted.

A good way is to select a tooth of correct shape and let file down into it, tighten set screw in handle, then file a tooth to see if the shape suits. If not turn the file a little to the right or left and try another tooth until the proper shape is obtained. Then file every other tooth, see cut No. 1; when one side is filed, reverse saw and attachment and adjust as in No. 2, and file the other teeth. For Rip Saws, place the file at right angles with the saw and file every tooth. Always keep the file as nearly horizontal as possible.

This filing guide is sold only attached to our No. 3 Improved Clamp or Vise, and not sold separately. We recommend this as the best saw clamp on the market, being quickly and easily adjusted, and not liable to get out of order.

Write for price including No. 3 Clamp, Filing Guide, File and Handle complete: Packed one in a wooden box.

**Henry Disston & Sons, Philadelphia, Penn.** INCORPORATED,

# ARCADE FILE WORKS.



EASTERN OFFICE,  
NEW YORK.

WARRANTED FILES AND RASPS.

FACTORY  
ANDERSON, IND.

WESTERN OFFICE.  
CHICAGO.

## THE FILES THAT LEAD THEM ALL

THE BEST EQUIPPED FILE WORKS IN THE WORLD.

"The fact that the Arcade File Works alone use the improved File Machinery recently invented by Alfred Weed, and the even heat of natural gas, enables them to produce files that cut faster and wear longer than any on the market."

### IRON RESERVOIR VASES.



Nearly 100 styles and sizes.  
List prices from \$6.00 to \$100.00 each.

These Vases are made with a reservoir for water, from which a constant and even supply of moisture is drawn by capillary attraction, and they do not need watering often than once in ten or fifteen days. Thousands of Reservoir Vases are in use on lawns and in cemeteries all over the country. Our prices are no higher than those of ordinary vases.

Catalogue sent on application.

**WALBRIDGE & CO.,**  
BUFFALO, N. Y.



### HOW TO KEEP A STORE

BY S. H. TERRY.

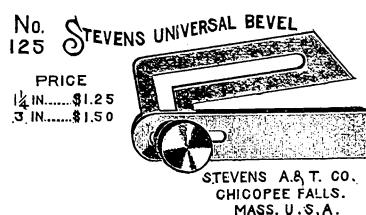
408 PAGES, 5 x 7½ INCHES.  
POST-PAID, \$1.50.

Among the subjects discussed are: The selection of a business; choice of a locality; buying a stock of goods; examining, marking and arranging goods; how to advertise; employment of clerks; selling for cash and credit; keeping accounts; expenses; copartnerships; losses by fire, theft, &c.; influences of social life on business; buying at auction; investment of profits; insolvency; business qualifications

FOR SALE BY

DAVID WILLIAMS, Publisher and Bookseller,  
96-102 Reade St., New York.

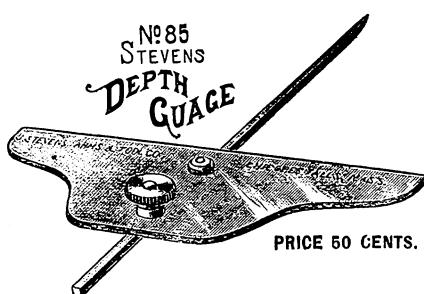
## FINEST Mechanical Tools



No. 125 STEVENS UNIVERSAL BEVEL

PRICE  
1/4 IN. .... \$1.25  
3 IN. .... \$1.50

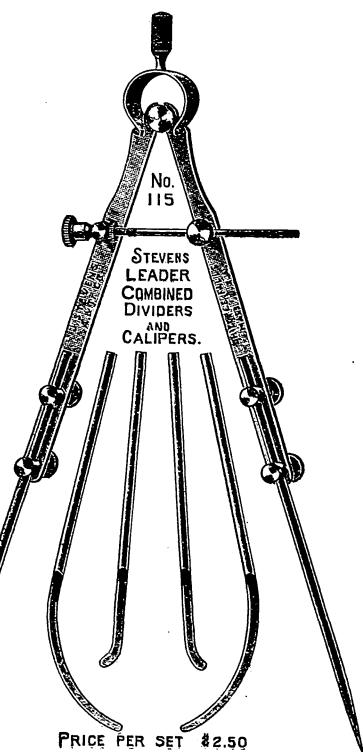
STEVENS A. & T. CO.  
CHICOOEE FALLS.  
MASS. U. S. A.



No. 85  
STEVENS

DEPTH  
GAUGE

PRICE 50 CENTS.



No. 115

STEVENS  
LEADER  
COMBINED  
DIVIDERS  
AND  
CALIPERS.

PRICE PER SET \$2.50

Send for Catalogue of full line.

**J. Stevens Arms & Tool Co.,**

P. O. BOX 5729,

Chicopee Falls, - Mass.



Frame made of one piece of  
SPRING STEEL.

THE SNELL PATENT  
STEEL HAND SAW.  
80 to 100 lbs tension on blade.

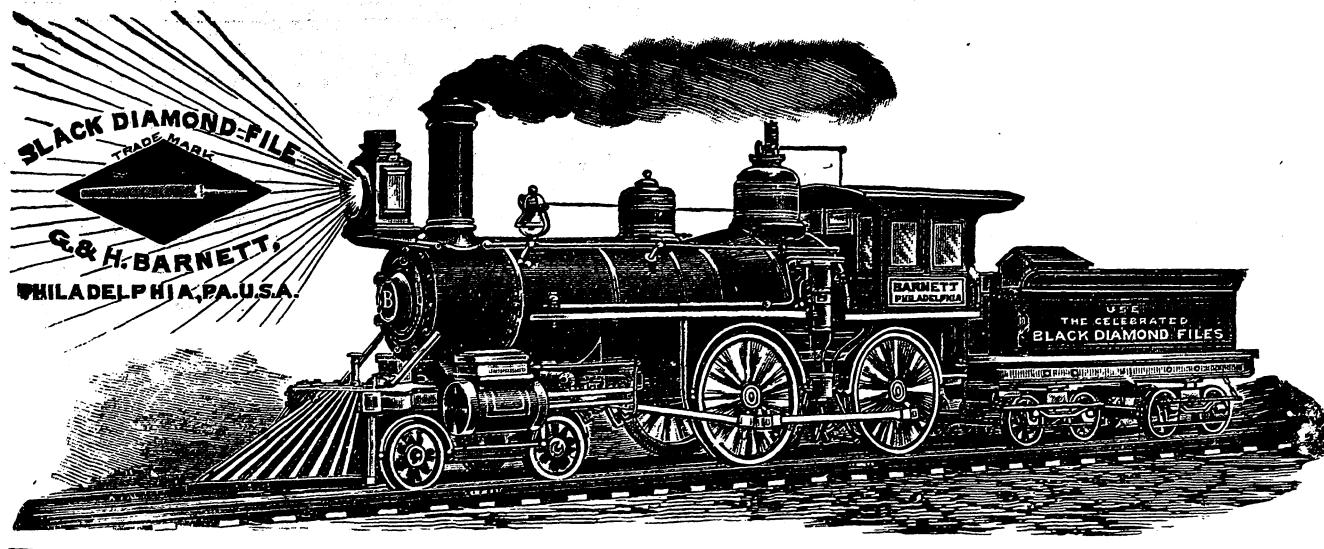
This saw is always ready for use. Never has to be adjusted after blade is put in. Will last a life-time.

Send for Descriptive Circular  
and Prices to

**Butler Mfg. Co.,**  
P. O. BOX 2180,  
BOSTON, MASS.

WILL NOT BEND NOR BREAK.

FACTORY, 330 to 338 First Street, So. Boston.



THE LARGEST AND MOST COMPLETE FILE WORKS IN THE WORLD.

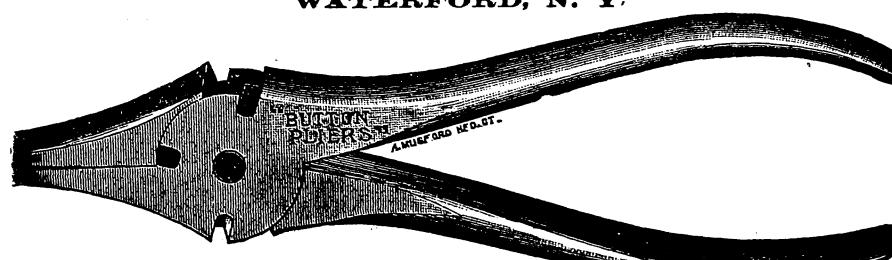
## NICHOLSON FILE CO.

PROVIDENCE, R. I.

3000 VARIETIES FILES  
[X.F.] AND INCREMENT CUT FILES

## J. M. KING & CO.,

WATERFORD, N. Y.



Established by DANIEL B. KING, 1829.

Philadelphia, 1876.



McCaffrey File Co.,

FIFTH and BERKS STS.,  
PHILADELPHIA, PA.

For Superiority.



Manufacture and keep in stock a full line of FILES and RASPS only, for which we claim special advantages over the ordinary goods, and ask domestic and foreign buyers to allow us to compete for their trade.

Superiority acknowledged wherever used, sold or exhibited.

BEST  
CRUCIBLE  
STEEL.

"TROJAN" HORSE RASPS AND FILES.

LOWEST  
IN  
PRICE.

STRONGEST  
TOOTH.

BANKER & WHITE,

(Troy File Works.)  
N. Y. Agent GEO. M. MATTESON 111 Duane St.

TROY, N. Y. LET

US  
QUOTE. N. Y. Office and Salesroom, 104 & 106 John St.  
Factory, 103 to 119 N. 3d St., Brooklyn, E. D., N. Y.

## HOWARD IRON WORKS, BUFFALO, N. Y.

Manufacturers of

## BENCH VISES.

Price Lists sent on application.

## American Stamping Co.,

Manufacturers of  
All Kinds of Tinware and Sheet  
Metal Goods.



# John Wilson's Butchers' Knives and Steels, Skinning, Sticking, Farriers' & Shoe Knives,

Have established and maintained their reputation, for superiority, against all Competitors, from

**THE YEAR SEVENTEEN HUNDRED & FIFTY,**

and are still in increasing demand. As in the past, it is the unalterable DETERMINATION OF THE HOUSE TO SEND OUT NOTHING BUT WHAT IS OF THE HIGHEST POSSIBLE QUALITY.

WORKS: SYCAMORE STREET, SHEFFIELD, ENGLAND.

SOLE AGENTS FOR THE UNITED STATES, AND THE CANADAS.

Messrs. Hermann Boker & Co., 101 and 103 Duane St., New York.

1853

1894

Highest Awards at the World's Exposition for Superior Tools.

## GREETING

TO THE HARDWARE TRADE:

At the age of 20 I left my native place, Sheffield, England, in response to a call from the late D. R. Barton, of Rochester, N. Y., who was then trying to meet the demand for a class of Edge Tools that would be equal to the English Tools. I took charge of the Finishing Department, and was in his employ about four years, when I came to the conclusion that I could manufacture CHISELS and GOUGES equal to any imported, hence the origin of BUCK TOOLS. I began in company with my brothers, John Buck and R. T. Buck (both now deceased). We commenced with the Tools stamped Chas. Buck & Co., under which name we formed the foundation of the name and stamp of Buck Brothers. For 20 years I did a greater part of the forging and tempering, which established BUCK TOOLS with the reputation of being the best Tools in the market. In 1872 I retired from said firm. In 1873 I again commenced to manufacture BUCK TOOLS and stamp them CHARLES BUCK, and again I have established a reputation of making the best Tools in the market, and I would caution all, if they want the best, to see that they get those stamped CHARLES BUCK. Yours very respectfully, CHARLES BUCK.

CHARLES BUCK,  
The only surviving Member of the  
Original firm of Buck Bros. Estab. 1853.

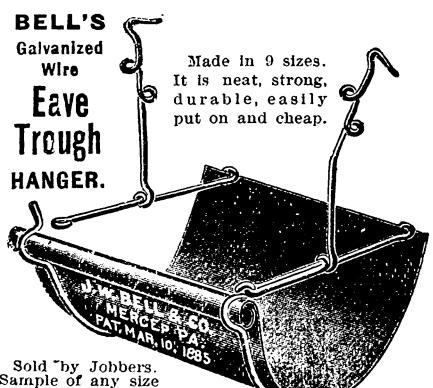
MILLBURY EDGE TOOL WORKS,

MILLBURY, MASS.



AMERICAN TOOL COMPANY,  
NEW YORK,  
MANUFACTURERS OF  
TOOL CHESTS

Of all sizes, complete with tools, for Hardware, Toy, Notion and Variety trades.  
Factory and Salesroom,  
200 West Houston Street, near V  
Also Machinists' Tool Chests, empty. Illustrated Catalogue and prices furnished on application.



JOHN W. BELL & CO., Sole Mfrs., Mercer, Pa.

CHAS. A. CONKLIN MANUFACTURING CO.  
Gen'l Southern Agents, ATLANTA, GA.



**WHITE, VAN GLAHN & CO.,**  
15, 16 and 17 CHATHAM SQUARE N. Y.,  
Dealers in GENERAL HARDWARE.

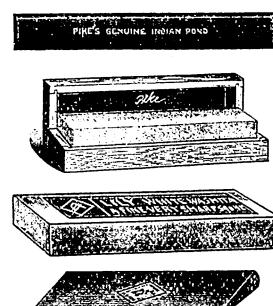
SOLE AGENTS IN THE U. S. FOR THE CELEBRATED  
J. B. Addis & Sons' Wood Carvers' Tools.

EMPIRE WINDOW SCREENS AND DOORS WITH PATENT FLY ESCAPE.

"Van Glahn" and "Gem" Lawn Mowers, Barb Wire, Green Wire Cloth, Poultry Netting, Farming Tools, Etc.

WRITE FOR PRICES.

SHARP TOOLS are a NECESSITY to a good workman,  
But without a GOOD WHETSTONE they are an impossibility.



**PIKE'S WHETSTONES.**

Pike's Indian Pond Scythe Stone, Strong, Sharp Grit, Quick Cutting.

Scythe Stones.

Oil and Water Stones.

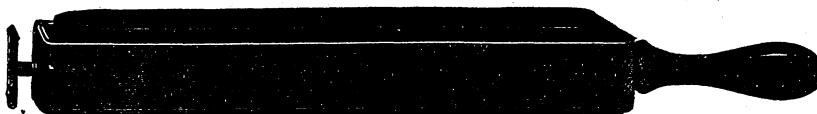
GREEN MOUNTAIN,  
LAMOILLE,  
BLACK DIAMOND,  
PREM. QUINNEBAUG,  
WHITE MOUNTAIN,  
GENUINE RAGG,  
WILLOUGHBY LAKE.

WASHITA,  
ARKANSAS,  
HINDOSTAN,  
WATER OF AYR,  
RAZOR HONES,  
TABLE HONES,  
AXF STONES, ETC.

**THE PIKE MFG. CO., - Pike Station, N. H.**

**J. R. TORREY & CO., Worcester, Mass.**

New York Office: 74 Reade Street.



No. 8 X.

The TORREY RAZOR STROPS are known the world over as the standard for excellence in setting a fine edge. We manufacture and carry in stock more than 150 styles.

Send for Illustrated Catalogue.

"Stamped with the BUCK'S HEAD."



TRADE-MARK.

**BUCK BROTHERS,  
MILLBURY, MASS.**

The Most Complete Assortment in the U. S. of  
Shank, Socket Firmer and Socket Framing  
Chisels, Fine Bevel Edge Chisels, Plane Irons

**TWO PRIZE MEDALS,**

No. 1098 and No. 1099, AT WORLD'S FAIR.

Buyers are cautioned against any parties who claim a recent connection (or any connection for over 20 years) with Buck Bros., or who represent goods as our make not stamped with the BUCK'S HEAD or BUCK BROTHERS in full.

1825 R. HEINISCH.

1871 R. HEINISCH'S SONS.

1892 R. HEINISCH'S SONS CO.

**CAUTION.**

TO ALL PURCHASERS OF THE

**WELL KNOWN HEINISCH BRAND OF****Shears, Trimmers, Scissors, Tinners' Snips, &c.**

All Goods of our Manufacture are Stamped

R. HEINISCH

OR

R. HEINISCH

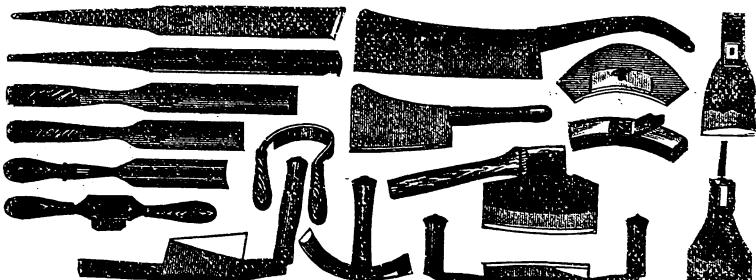
NEWARK, N.J.

NEWARK, N.J.

U. S. A.

**NO OTHERS ARE GENUINE.**NEW YORK OFFICE AND SALESROOM,  
90 CHAMBERS ST.R. HEINISCH'S SONS CO.,  
NEWARK, N. J., U. S. A.

HIGHEST AWARD PARIS EXPOSITION, 1889.

ESTABLISHED 1837.  
INCORPORATED 1892.**THE L. & I. J. WHITE CO.,**

MANUFACTURERS OF

**EDGE TOOLS.**Coopers', Carpenters' and Ship Tools, Plane Irons,  
Cleavers, &c. Full Line Chisels.**SICKELS, SWEET & LYON,**

Wholesale Hardware.

Office, 35 Barclay St. Warehouse, 40 Park Place, New York.

**Carry Stock of Jackson, Mich., Farming Tools**

Shipments from Factory if preferred.

N. Y. AGENTS FOR

Cortland Door and Window Screen Co., Union Steel Screw Co., Eagle  
File Co., Perfection and New Easy Lawn Mowers.  
Spring Catalogue No. 7 issued in February.**Cast Shears.****ACME SHEAR CO.,**

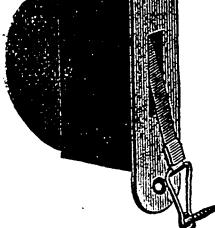
BRIDGEPORT. - CONN.

**8 Years' Experimenting**

Gives us many advantages over all others in producing the only

**Steel Frame Sash Balance**

Made in the U. S. It is the most durable device ever invented for counter balancing the weight of sash.

NO POCKETS OR  
BOXES REQUIRED.

Can be used in old as well as new houses. Warranted 15 years.

Write for Illustrated  
Price-List.**PULLMAN SASH BALANCE CO., Rochester, N. Y.**New York Office, 142 Chambers St.  
Chicago Office, 235 Lake St.**WHEN IN WANT OF  
WOSTENHOLM'S  
I★XL****Knives OR Razors,**

SEND TO

**FRED. B. GURNEY,**  
116 Chambers St., N. Y.

IF YOU WANT THE BEST  
BRITANNIA SPOONS  
FOR CATALOGUE & PRICES  
THEIR MAKE IS EQUAL EAST HADDAM & SON  
IF NOT SUPERIOR  
TO ANY OTHER  
HAVE BEEN IN BUSINESS SINCE 1840 CONN.

IF YOU WANT THE BEST  
NICKEL SILVER SPOONS  
FOR CATALOGUE & PRICES  
THEIR MAKE IS EQUAL EAST HADDAM & SON  
IF NOT SUPERIOR  
TO ANY OTHER  
HAVE BEEN IN BUSINESS SINCE 1840 CONN.

IF YOU WANT THE BEST  
SILVER PLATED SPOONS  
FOR CATALOGUE & PRICES  
THEIR MAKE IS EQUAL EAST HADDAM & SON  
IF NOT SUPERIOR  
TO ANY OTHER  
HAVE BEEN IN BUSINESS SINCE 1840 CONN.

**CUTLERY**Will mark price &c.,  
on cutlery.**ENAMEL**Guaranteed not  
to rust.Flows from Pen as readily as ink.  
FREE BY MAIL, 50 CENTS.A. B. SHIPLEY & SON, 503 Commerce St.,  
Philadelphia, Pa.

## THE LATEST.



## THE VICTORIA.

We have a full line of above, which is the neatest pattern ever presented to the trade, and it is stamped



NONE GENUINE WITHOUT THIS TRADE-MARK.

**WM. ROGERS MFG. CO., Offices, Hartford, Conn.**  
FACTORIES HARTFORD, CONN., NORWICH, CONN., AND TAUNTON, MASS.

## SILVER PLATED KNIVES AT REDUCED PRICES.



WINDSOR. PLAIN HANDLE.

THESE PATTERNS AT SPECIAL FIGURES.

An opportunity for the Hardware Dealer. Offer not repeated this season.



WINDSOR. ARAB HANDLE.

Full 12 dwt. Stamped our name and trade-mark.

Combination Sets, 6 Knives and 6 Forks, In Satin Lined Case, at same price as Knives.

—SEND FOR PRICES.—

**THE HOLMES & EDWARDS SILVER CO., - BRIDGEPORT, CONN.**

**NORTHAMPTON CUTLERY COMPANY, NORTHAMPTON, MASS.**

NEW YORK  
SALESROOM,

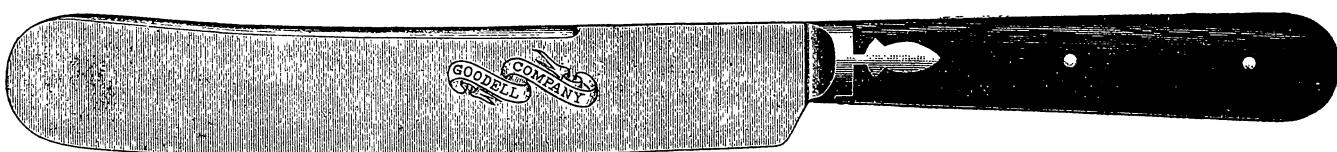


122 Chambers  
Street.

TABLE CUTLERY, BUTCHERS' CARVERS, PLATED GOODS, &c.

Send for Revised Catalogue.

**GOODELL COMPANY,**  
ANTRIM, N. H.



— : MANUFACTURERS OF : —

Table Cutlery, Butcher Knives, Carvers, Shoe Knives, Butcher Steels, &c., &c.

The quality and finish of our goods is unsurpassed. Our prices are suited to the times. Our new catalogue will be ready for distribution April 1st. Send for one if desired.

## AGENTS

THE ALFORD & BERKELE CO., 77 Chambers St., N. Y. City.

HENRY KEIDEL & CO., Baltimore, Md.

A practical means of rapidly reaching absolutely accurate results without the mental wear of computing.

It gives at a glance the net of any sum at a great range of discounts, simple and complex, and it is accurate, rapid and practical. Price, \$3.00; Double Indexed Edition, \$4.00.

Mailed, postpaid, upon receipt of price by DAVID WILLIAMS, 96-102 Reade Street, New York.

**LADD'S DISCOUNT Book.**

PATENTED IN ALL COUNTRIES.

## INJUNCTION NOTICE.

## THE U. S. COURT SAYS IN ITS DECISION:

The defendant admits making and selling Box Straps which clearly contain CARY'S PATENTED INVENTION, although the "Bosses" are shaped differently than those shown in the drawings. "Injunction granted."

All Goods put up in this style to be genuine must bear the name of the CARY MANUFACTURING CO., stamped on each reel.

CARY MANUFACTURING CO., 5 to 9 Elm St., NEW YORK.

Showing Reel hung up ready for use.  
SIX PATENTS.

Dated: May 14th, 1889; Nov. 25th, 1890.



This is a fac-simile of the label on my VULCAN TOOL CO. brand of HATCHETS; a brand for which I have a regular trade in some sections, but to those who have not "caught on"—dealers who are handling an outside brand—I offer a limited quantity at a very low price. Inquiries for price solicited.

FAYETTE R. PLUMB, Philadelphia.

—THE—

"CLAUSS" CARVER.



The Carver surpasses everything of its kind. It cuts ham and meats of all kinds with exactness, and in just as thin slices as you wish, and does not make an uneven slice. For carving turkey or any kind of fowl it has no equal. It separates the pieces and meat to perfection, and does not tear. We cannot say enough for it; it must be seen and used to be appreciated. The blades of these knives are all made of the finest steel; the handles are malleable iron riveted onto the blades securely. They cannot get loose, or come off. The bread knife, cake knife and carver have scalloped or serrated edges, recently improved, which makes them cut one-half easier than an ordinary knife. They are fully guaranteed, and if not as represented will be taken back and replaced.

THE CLAUSS SHEAR CO.,

Fremont, Ohio, U. S. A.

OUR  
AMERICAN

And Safety Hammer

Double Action in 32, 38 & 44 Cal.

H. & R. Imp. Ejecting Double Action,

H. & R. Imp. Automatic Double Action,

In 32 and 38 Caliber.

And Premier Double Action, Rebounding Lock,

In 32 and 38 Caliber.

All the above 32 Caliber take the H. & R. LONG or

S. & W. Short C. F. Cartridges.

For Sale by all dealers in Hardware, Guns, and Sporting Goods.

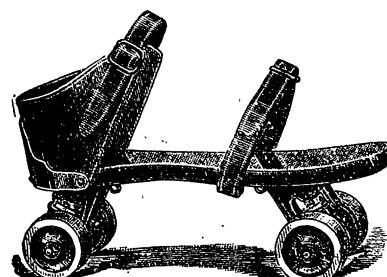
HARRINGTON & RICHARDSON ARMS CO.,

Worcester, Mass., U. S. A.

HENLEY'S - CELEBRATED

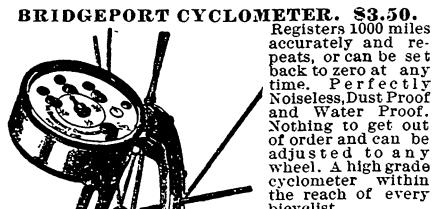
Rink AND Club

Roller Skates.



A full, new and complete stock of Roller Skates, Skate Repairs and Rink Supplies. Address for 80 page Catalogue and Prices,

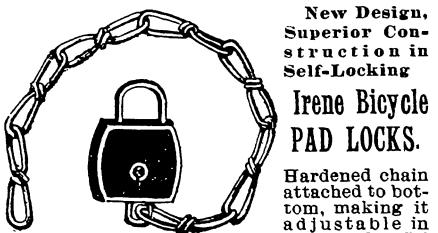
M. C. HENLEY,  
RICHMOND, - - - IND.



BRIDGEPORT CYCLOMETER. \$3.50.  
Registers 1000 miles accurately and repeats, or can be set back to zero at any time. Perfectly Noiseless, Dust Proof and Water Proof. Nothing to get out of order and can be adjusted to any wheel. A high grade cyclometer within the reach of every bicyclist.

PRICE \$3.50.  
Made in two sizes, viz.: for 28-inch and 30-inch wheels. Send for catalogues and supplies. Sold by all bicycle dealers. Cyclometers will be ready for delivery April 1.

The Bridgeport Gun Implement Co.,  
313 and 315 Broadway, New York.



New Design.  
Superior Construction in Self-Locking  
Irene Bicycle  
PAD LOCKS.

Hardened chain attached to bottom, making it adjustable in length. Two flat keys. Weight complete, 1 1/2 oz. For circular and

W. H. DIEFFENBACHER & CO.,

154 Lake Street, Chicago.

—REMEMBER—

WE MAKE ONLY

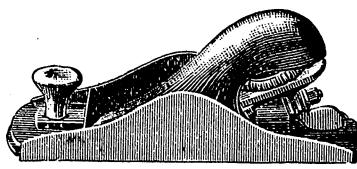
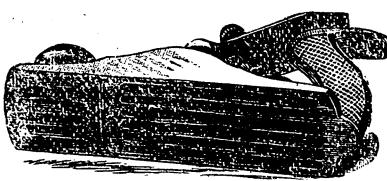
The Very Highest Grade  
OF

MECHANICS' TOOLS.

W. H. MAYHEW CO., Shelburne Falls, Mass.

# CARPENTERS' AND MACHINISTS' TOOLS.

Chaplin's Pat.  
Iron Planes,  
Corrugated  
Bottoms,  
Checkered  
Rubber Handles.



Chaplin's Block  
Planes, Solid  
and Adjustable  
Throats.  
Nickel and  
Japan Finish.

## TOWER'S CHAMPION SCREW DRIVERS.

The Fluted  
Handle Gives  
the Best  
Possible Grip.



CHAMPION CABINET SCREW DRIVER.

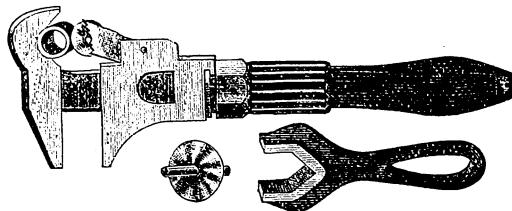


CHAMPION SCREW DRIVER.

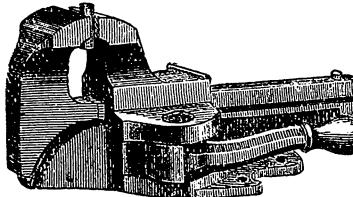


CHAMPION MACHINISTS' SCREW DRIVERS.

ENGINEERS'  
WRENCHES,  
SHORT AND  
LONG NUTS  
AND WITH  
PIPE  
CUTTERS.



STEPHEN  
VISES,  
STATIONERY  
AND  
SWIVEL  
BASES.

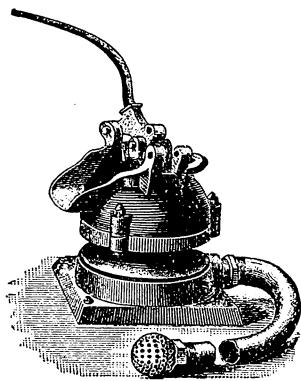


ALSO PLUMB  
BOBS,  
TRAMMEL  
POINTS,  
LEVELS,  
OILERS,  
WRENCHES, &c

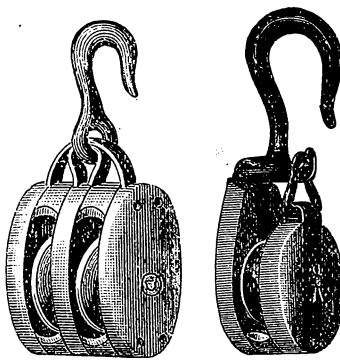
TOWER & LYON, Manufacturers,

95 Chambers St., New York.

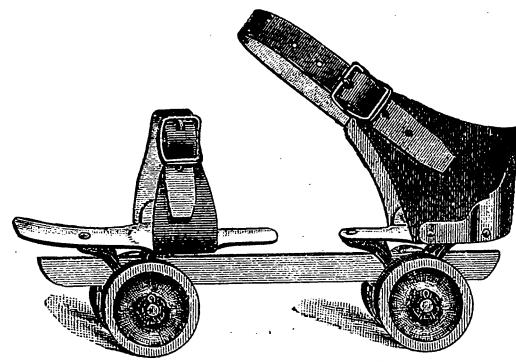
## TACKLE BLOCKS, GUN IMPLEMENTS, DOG COLLARS, ICE AND ROLLER SKATES, MALLETS, ETC.



Loud's Patent



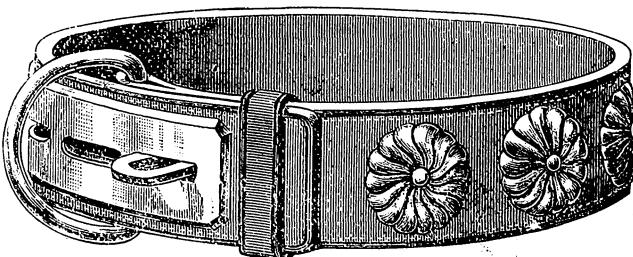
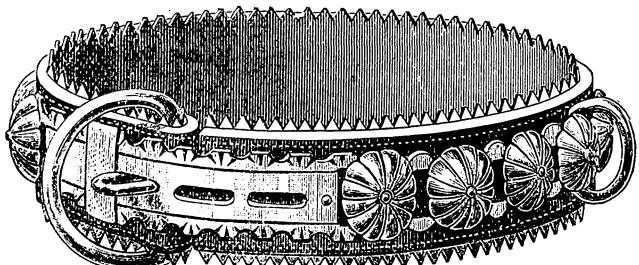
Union Brand



Side-Walk and Rink

ROLLER SKATES.

A Full Line of Dog Collars, Muzzles, Leads, Etc.



**UNION HARDWARE CO., - TORRINGTON, CONN.**

New York Office, TOWER & LYON, 95 Chambers St., New York.

# DAME, STODDARD & KENDALL,

374 Washington St., Boston, Mass.

IMPORTERS, MANUFACTURERS' AGENTS AND JOBBERS OF FINE FISHING TACKLE.

#### OUR LEADING SPECIALTIES ARE:

**Skinner's Celebrated Fluted Trolling Spoons.**

Patent Adjustable Floats and Sinkers.

**Bray Fly Books.**

"Neverbreak" Split Bamboo Rods.

**"Neverbreak" Braided Silk Lines.**

Crosby's Hunting Hatchets.

**Littlefield's Collapsing Net Ring and Staff,**

The Latest and Best Ring on the Market.

SEND FOR OUR NEW CATALOGUE.

# THE SAMUEL WINSLOW SKATE MFG. CO.,

Worcester,



Mass., U. S. A.

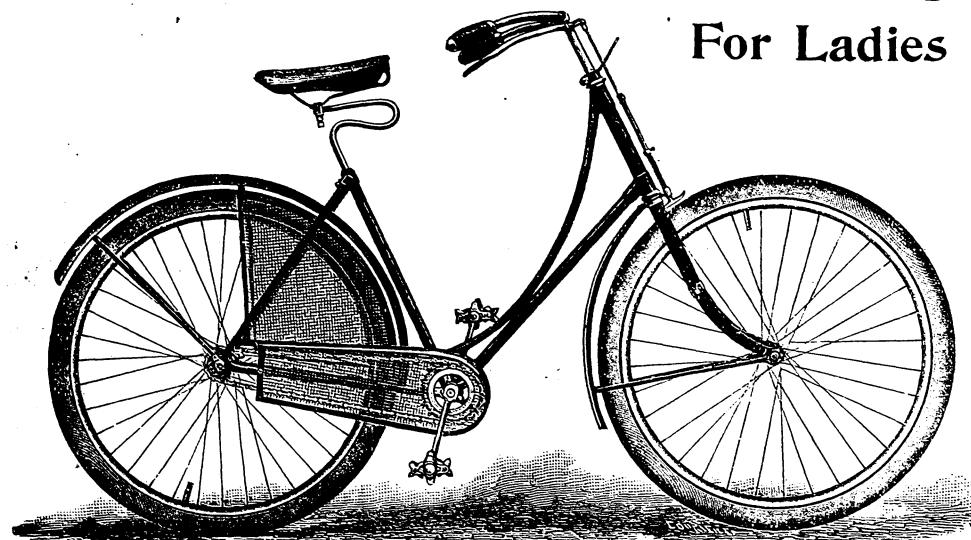
**The most extensive Skate Factory in the World.**

# New 1894 "Queen City" Safety.

For Ladies and Misses.

Full Ball Bearings  
Throughout.

*In all respects  
a first-class  
machine.*



MANUFACTURED BY

GEO. N. PIERCE & CO.,

BUFFALO, N. Y.

#### ELEMENTS OF COST.

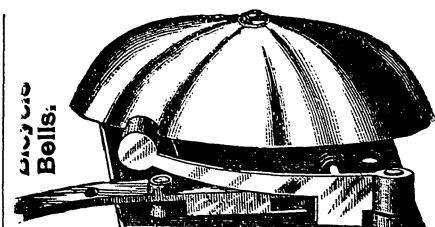
By Frederick W. Child.

20 PAGES,

5 x 7½ inches.  
Paper, 25 Cents.

An address to the Institute of Accountants, New York, of which the writer is a member, put in form to assist those in charge of manufacturing accounts. Practical forms are included for a series of order books, examples of foreman's order, form of pay-roll, quarter-time book, job time book, form of summary, charges book, summary of costs, material, labor, cash, expense, manufacturing and improvement acts, store-room, iron foundry, brass foundry. Sent post-paid on receipt of price, by

DAVID WILLIAMS, Publisher and Bookseller, 96-102 Reade Street, New York.



BEVIN BROS. MFG. CO., Easthampton, Conn.  
Manufacturers of  
Sleigh Bells, House, Tea, Hand, Gong Bells, &c.



### To Make a Bull's Eye

In Your Business or at the Range?  
If you deal in ARMS or AMMUNITION or shoot a Rifle, Pistol or Shot Gun, you will make a HIT by sending for the IDEAL HAND BOOK.

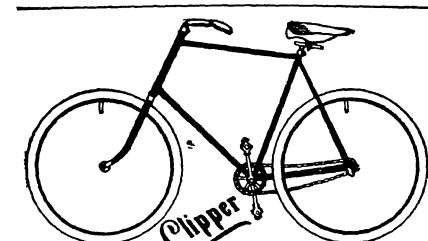
IDEAL MFG. CO., New Haven, Ct., U. S. A.

Please mention *The Iron Age* when you write.

**Bicycle Locks.**  
**Bicycle Bells.**  
Especially Low Prices.  
We manufacture hardware specialties of all descriptions to order.

HAINES & ZIMMERMANN, 407 Cherry St., Phila

**HEATH'S**  
**BALL VALVE PUMP**  
AND  
**UNIVERSAL COUPLING,**  
For Bicycle and Sulky Wheels.  
The handiest, windiest, strongest pump in the world at any price.  
Price \$2.00.  
Liberal discount to the trade.  
Manufactured by  
S. F. HEATH CYCLE CO.,  
Minneapolis, Minn.



### Clipper Bicycles

are built to please the dealer and rider.

Are you in the bicycle business? If not, you can make it pay to handle Clippers. Buy direct from the manufacturer and save the jobbers profit. It will add considerably to your bank account. We want responsible dealers only. We may be able to interest you, in fact we are sure of it. Our policy is a protective one, and will please you. It protects against Scalpers and "Curb Stone Brokers."

Grand Rapids Cycle Co.,  
Grand Rapids, Mich.

### Every Year

the "STERLING" becomes more popular with dealers. They find it gives better satisfaction than any other wheel. No worry o'er repairs.

### THE STERLING

(Built like a Watch.)

A wonderful, strong, light wheel, with a dozen points of superiority over all others. Our "new departure" catalogue (free) tells all about it.

STERLING CYCLE WORKS,  
234 Carroll Ave., CHICAGO

## LOVELL DIAMOND CYCLES.

### HIGHEST GRADE.

All Sizes and Prices. See our line before you purchase.

All the Latest Improvements.

### FULLY GUARANTEED.

**JOHN P. LOVELL ARMS CO., M'f'rs,**  
BOSTON, MASS.

SEND FOR CATALOGUE, FREE TO ALL.

AGENTS WANTED.

## Do you want to buy Bicycles CHEAP?

If so, write to us for prices on the Falcon No. 1, Falconess, Falcon Junior (boys' bicycle) and Hackney.

**THE W. BINGHAM COMPANY,**  
CLEVELAND, OHIO.

## DO YOU HANDLE BICYCLES? IF NOT, WHY NOT?

Handle  
the  
Bicycle  
that is a  
Money  
Maker.

*The Wellington* **Is a Sure  
Winner!**

**2 SIZES.** No. 1, \$125.00, Weight 28 lbs.  
No. 2, \$100.00, Weight 31 lbs.  
Write for Terms and Discounts to Agents.

**STOKES MFG. CO., Makers,** - 298 Wabash Ave., Chicago.  
WESTERN BRANCH, UNION CYCLE MFG. CO.



**THE "PERFECTION" Ball  
Bearing  
Girls'**

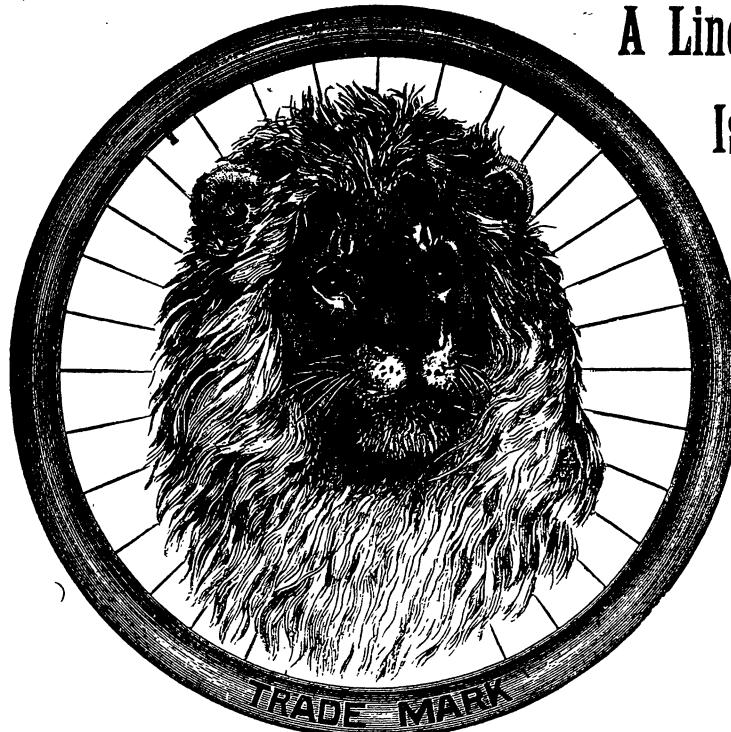
Run as easily as Bicycles. Cost about the same as old style parallel bearings. Sold by Hardware and Toy Jobbers. Manufactured by

**The Toledo Metal Wheel Co., Toledo, O. Tricycles.**

**WE** are headquarters on Plated Knives, Forks, Tea Spoons, Table Spoons, Dessert Spoons, Coffee Spoons, Bar Spoons, Julep Strainers, Ice Cream Spoons, Orange Spoons, Sugar Shells, Butter Knives, etc., etc., etc. Our unplated nickel silver goods, light and heavy, are the best in the market, so our customers say, and they ought to know.

Write us for prices and be convinced.

**KELLEY & McBEAN, Niagara Falls, N.Y.**



A Line of Hardware

Is not Complete Without

## MONARCH BICYCLES.

They will make you more money than anything you can handle.

At the World's Columbian Exposition they received a general award for all points, including

**Design, Workmanship and Finish.**

Prices, \$90.00, \$100.00, \$125.00.

Weights, 25 to 34 pounds.

Send for twenty-four page catalogue.

**MONARCH CYCLE CO., Lake & Halsted Sts. Chicago, Ill.**

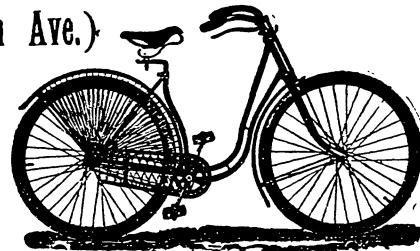
(Retail Salesroom, No. 280 Wabash Ave.)



**C. F. GUYON CO.,**

Nos. 97 and 99 Reade St., New York,

Genl. Eastern Distributing and Sales Agents.



\$85.

*Waverley*

INDIANA BICYCLE CO.,

None Higher in Quality.

Highest Grade, \$85.00, Fitted with "G. & J." Tires.

We are desirous of securing a first-class representative in every city, town and hamlet in the United States, and will guarantee the best bicycle in the world for the money. Dealers should investigate our line if they are looking for a leader that will sell itself and make them money.

**CATALOGUE FREE.**

Indianapolis, Ind., U. S. A.

THE CRAWFORD MFG. CO.

MAKERS OF  
HIGH GRADE AND JUVENILE

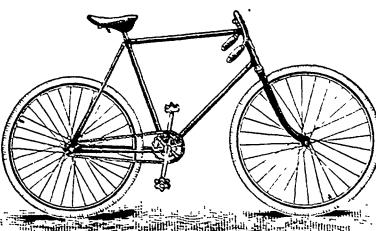
**BICYCLES,**

FACTORY, HAGERSTOWN, MD.

NEW YORK OFFICE, 72 READE STREET. L. B. Whymper, Mgr.

Remington

Cycles.

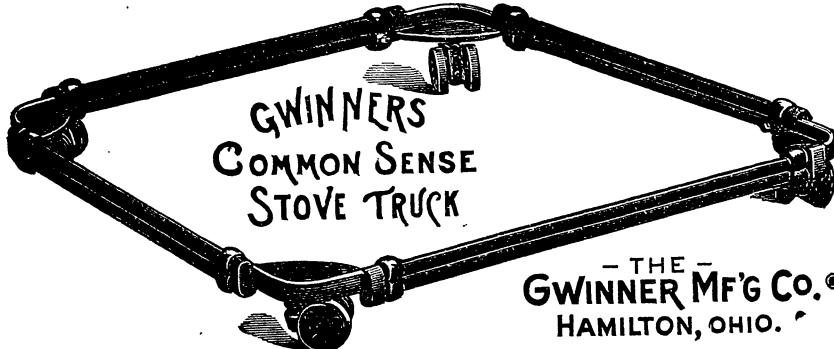


In Design, Workmanship, Material and Finish they are BEST.

SEND FOR CATALOGUE.

Remington Arms Company

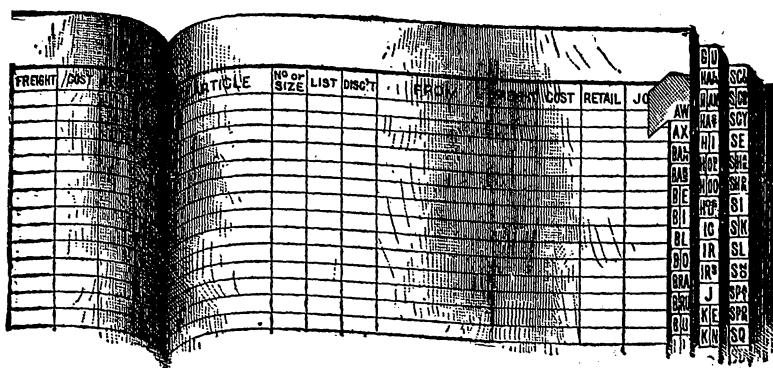
313-315 Broadway, New York.



- THE -  
**GWINNERS**  
HAMILTON, OHIO.

# The Iron Age Hardware Price Book E.

SECOND EDITION, REVISED AND ENLARGED, WITH MULTIPLE INDEX (Patent Pending).



AD	GU	SC <sup>O</sup>
AN	HAL <sup>M</sup>	SCR
AU	HAN	SCY
AW	HAS	SE
AX	HI	SHA <sup>E</sup>
BA <sup>N</sup>	HOD <sup>L</sup>	SHO <sup>R</sup>
BAR <sup>S</sup>	HOO <sup>O</sup>	SI
BE	HOS <sup>U</sup>	SK

Fac-Simile of Indexing.

**SIZE.**—The book is 7 x 10 inches (much larger than Price Books A, B, C, or D), 350 pages.

**PAPER.**—The paper is the celebrated Crane's heavy ledger paper, tough and strong, permitting frequent changes and erasures.

**BINDING.**—The binding is of the very best quality—flexible seal grained leather.

**INDEX.**—By means of the arrangement shown in the cut the index applies to every page (except Supplement) and permits reference to any article at a single motion. This greatly facilitates the use of the book, avoiding the troublesome turning from page to page which is necessary in connection with other Price Books. It has been prepared with great care, and it is believed that it provides a place for every article in the Hardware line.

**ARRANGEMENT.**—The book is arranged to keep a complete record of prices on a single page, the width giving sufficient room.

**SUPPLEMENT.**—A 40-page Supplement is provided to give room for supplemental quotations, memoranda, tables, &c.

**THIS BOOK IS ISSUED IN ONLY ONE EDITION, PRICE, \$5.00.**

## Advantages of Multiple Index Price Book.

A SPECIAL feature of the books is the arrangement of the index characters, which, instead of being alphabetical, are arranged with special reference to the classification of Hardware goods, each index character giving the first two or three letters of the names of Hardware articles as shown above. The ease and convenience with which the books can be used is indicated in the following examples, taken from Book F:

For Augers,	turn to	AU	For Chisels,	turn to	CH <sup>O</sup>	For Iron,	turn to	IRO
" Parers, Apple	"	PAP <sup>R</sup>	" Cutlery,	"	CUT	" Irons,	"	IR'S
" Saws,	"	SAW	" Cartridges,	"	CAR	" Shovels,	"	SH <sup>R</sup>
" Pumps,	"	PUM <sup>N</sup>	" Rules,	"	RUB <sup>L</sup>	" Grindstones,	"	GRI
" Bits,	"	BIT	" Locks,	"	LO	" Stones,	"	STO

Special care has been taken to make the classification as indicated in the index correct and comprehensive, making provision for all Hardware articles and giving sufficient space for the keeping and recording of prices. It is thought that every strictly Hardware article has its first two or three letters given, thus permitting immediate reference to it by a single motion.

It is, however, obvious if any articles are not directly designated by the index characters, that the index, being alphabetical in its arrangement, indicates the place where quotations on such articles should be recorded. The supplement, however, may be found useful for quotations on any outside goods which the Hardwareman may desire to keep prices on, while at the same time it may be used if necessary for any overview of matter from the preceding pages, or to contain list prices or other matter relating to goods.

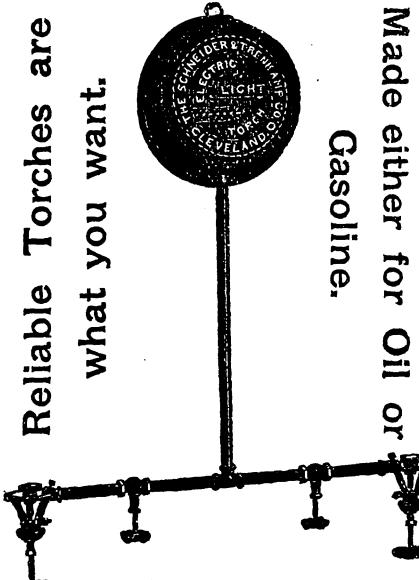
**Hardware Classification.**—A pamphlet containing a classification of the leading Hardware articles is furnished with the price books.

**Standard Lists.**—In connection with these price books a set of *The Iron Age* STANDARD HARDWARE LISTS can be used with great advantage. Price 25 cents.

These price books, which have been prepared by R. R. Williams, Hardware Editor of *The Iron Age*, are presented to the attention of Hardware men in the confidence that they will be found a most valuable aid in keeping track of prices.

Sent, Post-paid, on Receipt of Price, by

DAVID WILLIAMS, Publisher, - 96-102 Reade St., New York.

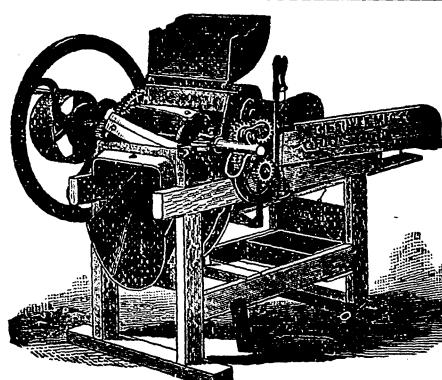


Reliable Torches are what you want.

Made either for Oil or Gasoline.

These Torches are particularly adapted for use in Factories, Foundries, Machine Shops, Rolling Mills, Blacksmith Shops, Warehouses, &c. They make a strong white light, are free from smoke and are not affected by wind or rain. They are convenient and portable. These Torches can be run at an expense of about one-half cent to one cent per hour, burning a bright, steady light which is ten times greater than the light of an ordinary gas burner.

Write us for prices. A liberal discount given to the trade. Manufactured by THE SCHNEIDER & TRENKAMP CO., Nos. 479 to 497 Case Ave., Cleveland, Ohio.



THE "OHIO" Feed and Ensilage Cutters and Carriers are the best.

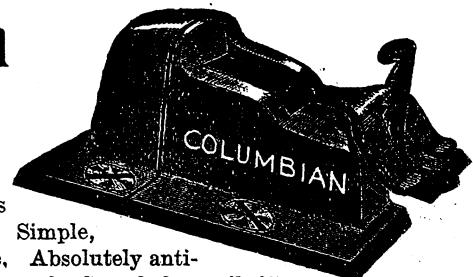
By reason of wide open throat and improved feeding device (being full width of cutting surface, all sizes), our machines have greater capacity than others.

THE SILVER MFG. CO. Salem, O.

Columbian

Sash

Locks three ways with one motion. Simple, strong and durable. Absolutely anti-rattle and burglar proof. Sample by mail, 35c.



Lock.

COLUMBIAN SASH & DOOR LOCK CO.,

WAUSEON OHIO.



## Ice Shredders.

For Shaving Ice

Coarse or Fine.

PRICES:

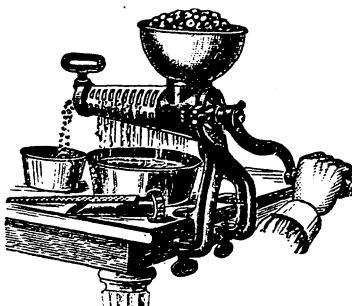
No. 33, Tinned, - - - \$7.20 per doz.  
No. 34, Nickeled, - - - 24.00 "

Their use will be appreciated

For Fruits, Drinks Oysters and Clams on the half shell, Olives, Celery, Radishes, Iced Tea, Sliced Tomatoes, &c., &c. and for many purposes in the Sick Room.

The Enterprise M'fg Co. of Pa.  
Third and Dauphin Sts., Philadelphia, Pa.

## Fruit, Wine and Jelly Press.



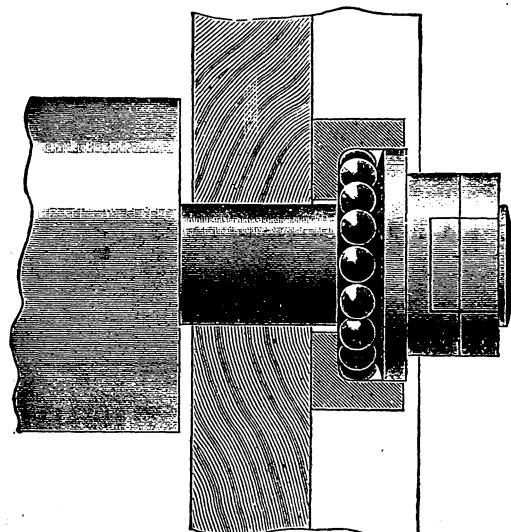
INVALUABLE FOR MAKING  
Wines, Jellies and Fruit Butters.  
Send for Catalogue (Free).

## Cherry Stoners.

PRICES.

No. 1, Japanned, - - - \$7.50 per doz.  
No. 2, Tinned, - - - 9.00 "

Can be adjusted by thumb screws to adapt them to the different sizes of Cherry Stones, and will be found very rapid in their work and equal to the best in the market.



## SOMETHING NEW. A BALL BEARING WRINGER. THE CLEVELAND.

Patent Applied for.

Only Successful one Ever Invented.

TURNS SO EASILY CAN BE OPERATED BY A CHILD.

All wearing parts revolve upon balls.

OTHER PARTS OF THE ORDINARY MACHINE IMPROVED.

STEEL SPRING AND CHANGEABLE APRON.

Altogether finest machine on the market. Remember this is not a roller bearing, but is made with balls in the bearings like bicycles, which we also manufacture.

FULLY GUARANTEED.

The Peerless Manufacturing Company,  
Cleveland, Ohio.  
OSGOOD & HOWELL, Pacific Coast Agts., 132 Market St., San Francisco, Cal.



THE DANGER STOVE & MFG. CO., CLEVELAND, O.

## —:OUR:— PURE ALUMINUM COOK- ING UTENSILS

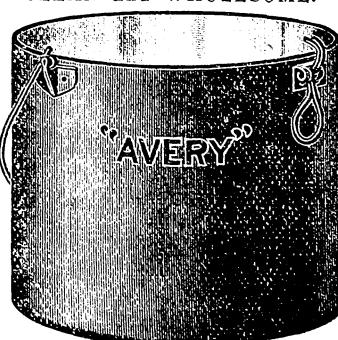
Meeting with such universal appreciation, we think it to our interest to appoint ONE responsible firm of Hardware Merchants in EACH town and city as our sole agents.

ILLINOIS PURE ALUMINUM CO.,  
LEMONT, ILLINOIS.  
Manufacturers of Sheets, Medals, Utensils.

“Originators of Steel Hollow Ware.”  
“PIONEERS OF HEAVY METAL STAMPING.”

“AVERY”  
“STEEL SPIDER”  
“POLISHED—TINNED—  
ENAMELED”  
“SILVER STEEL”  
HOLLOW WARE  
ALL KINDS OF  
HEAVY and LIGHT STAMPING, BLANKING, &c., &c.

CLEAN and WHOLESOME.



THE AVERY STAMPING CO., CLEVELAND, O.

# CHANTRELL TOOL CO.,

MANUFACTURERS OF

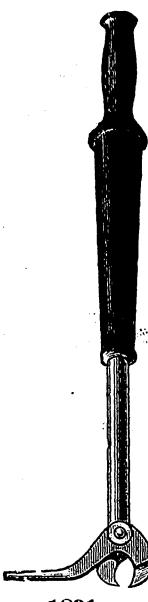
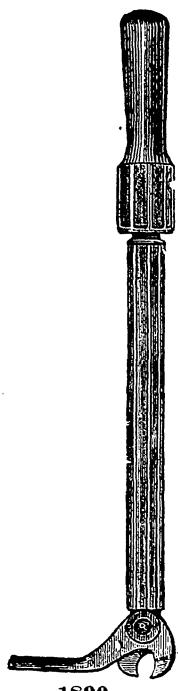
## NAIL PULLERS.

TWO PATTERNS.

1890—NICKEL PLATED, SPRING IN JAW.

1891—GIANT PATTERN, " " "

WARRANTED.



## TOOL HANDLES.

No. 21, COCOBOLA HANDLE, TEN TOOLS.

No. 2, LARGE, " EIGHT "

## STANDARD SCREW DRIVERS,

Round Forged Blades, Mahogany Handles.

GENERAL AGENTS,

**JOHN H. GRAHAM & CO.,**

{ 113 Chambers St.,  
N. Y. CITY, N. Y.

WRITE FOR PRICES.

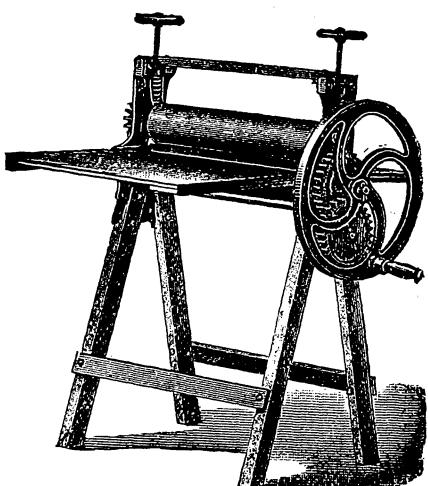
### The Family Mangle.

WARRANTED TO DO

Better Work than Hand-Work

SAVES all the fuel.  
two-thirds the work.  
Keeps the linen whiter.

We Guarantee Every Machine.



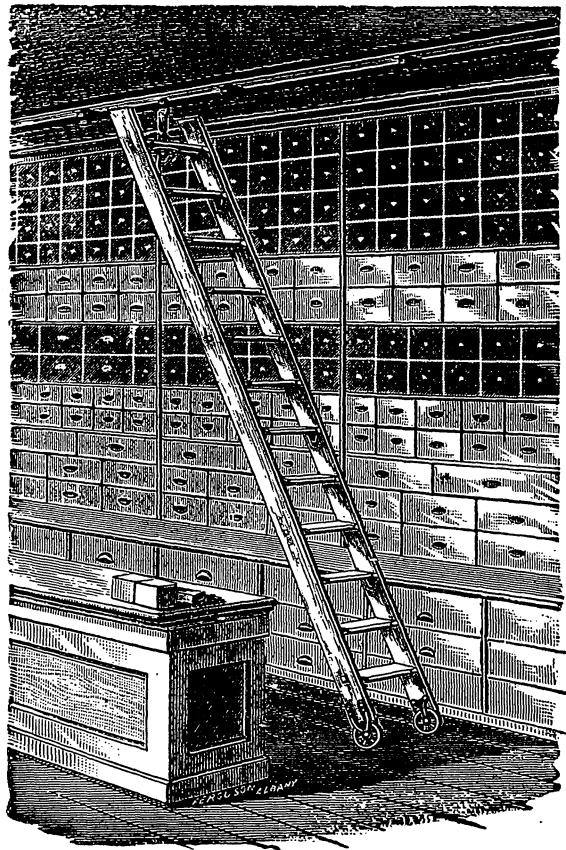
Send for descriptive circular to

**S. C. Johnson, Racine, Wis.**  
Agents Wanted.

**Vagaries of Sanitary Science.** By F. L. DIBBLE, M.D. The author claims that the whole sanitary movement thus far has no resemblance to scientific investigation. Much sanitary nonsense has been foisted on the people. He submits investigations on air, water, soil, sewer gas, cemeteries, public funerals, meat, milk, filth and fecal diseases, typhoid fever, yellow fever, cholera, diphtheria, epidemics, boards of health and vital statistics. His purpose is to show the true nature of diseases and the means of avoiding them scientifically. 1893. 482 pages, cloth..... \$2.00

For Sale by DAVID WILLIAMS, 96 102 Reade St., N.Y.

## THE "NOISELESS" STORE LADDER.

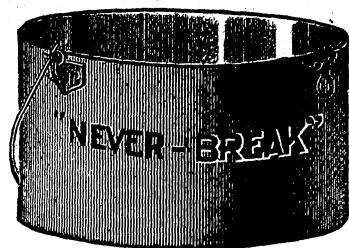


The latest and best. Perfectly noiseless. Neat in appearance.

Manufactured by

**ALBANY, N. Y.**

**M. CROISSANT,**



**'NEVER-BREAK'**  
WROUGHT STEEL COOKING UTENSILS.  
MIRROR POLISHED-TINNED-PORCELAINED.  
**"EXCELSIOR"** **"PURITAN"** **"IDEAL"**  
BAKING AND ROASTING PANS,  
PLANISHED AND PLAIN STEEL.  
COOKERS, COFFEE POTS AND  
OTHER SPECIALTIES.  
THE BRONSON SUPPLY CO.,  
NEW YORK AND CLEVELAND.



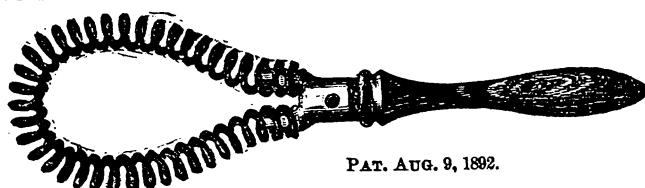
No. 3  
Globe Street Lamp.

Light your Streets and Driveways.  
The S. G. & L. CO.  
**Tubular Globe  
Street Lamp**

IS THE Best Street Lamp Manufactured.  
Equal to the best Gas Light.  
Will not Blow Out in the Strongest Wind.  
Will not Smoke.  
Will not Freeze.  
Automatic Extinguisher.  
Outside Wick Regulator.  
Will Burn Four Hours for One Cent.

MANUFACTURED BY  
**STEAM GAUGE AND LANTERN CO.,**  
SYRACUSE, N. Y.  
Western Branch, 25 Lake St., Chicago, Ill.

**THE BOSS DUST BEATER.**



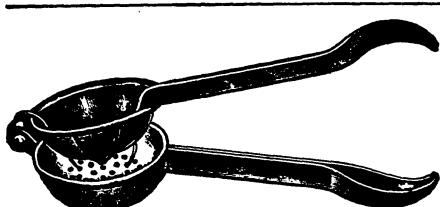
PAT. AUG. 9, 1892.

NEAT, DURABLE, AND DOES THE BUSINESS.

For removing dust and filth from Clothing, Upholstered Furniture, Rugs and Carpets it is just the thing. Will raise the nap and so improve the appearance. Will not, like other Dust Beaters, leave marks, nor tear the fabric. The coil is of steel wire secured in a malleable iron socket and attached to an enameled wooden handle. Just what everybody wants.

Sent by Mail, 35 Cents.

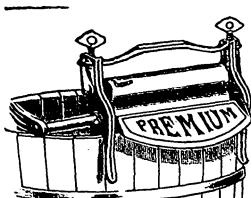
**PEABODY & PARKS,**  
Manufacturers, TROY, N. Y.



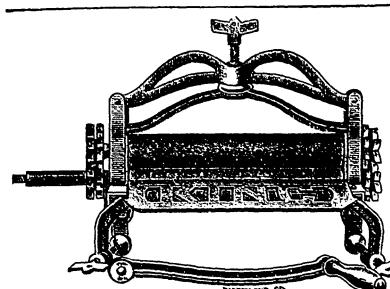
**Do you make Lemonade?**

If so you want our Squeezer. Positively the best. Suitable for any size Lemon. Write for catalogue and prices.

BERGER BROS., 237 Arch St., Philadelphia, Pa.



**COLBY WRINGER CO.,** Montpelier, Vt  
MANUFACTURERS OF THE  
**Premium Wringer,**  
With Automatic Apron Adjustment.  
SURPLESS, DUNN & ALDER, Direct Representatives,  
87 Chambers Street, New York.



We are Sole Manufacturers of the  
Celebrated Erie and King Wringers.

We also make all other brands of Wood and Iron Frame Wringers.

Exclusive sale of the **ERIE** and **KING** Wringers  
given to one dealer in each town.

Write for Catalogue.

**THE NATIONAL WRINGER CO.,** CANTON,  
OHIO.  
New York Office, 107 Chambers St., John T. Ryan, Mgr.

**John Chatillon & Sons,**

85, 87, 89, 91, 93 CLIFF ST., NEW YORK.

ESTABLISHED  
1835.

SEND FOR  
PRICE-LIST.



Sole Agents for  
Foster Bros.' Butchers' Cutlery.



John Chatillon & Sons, N. Y.

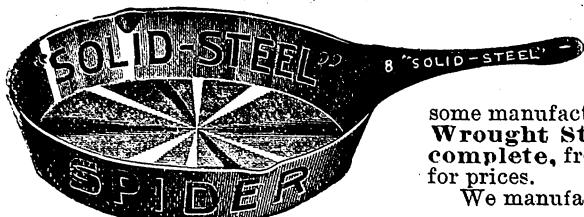
Porcelain Lined Lemon Squeezers



Best Common Mouse Traps, Steak Hammers,  
Boot Jacks, Lap Boards, Beacon Hill Pat. Mouse  
Traps, Mallets, Bung Starters, Hand Screws.  
Ripley Mfg. Co., Unionville Conn.

**THOMAS CLARKE**  
HARDWARE AND GENERAL AGENT.

(FIRST-CLASS REFERENCES.)  
60 PRINCE WILLIAM ST., ST. JOHN  
NEW BRUNSWICK.

**"SOLID-STEEL" SEAMLESS HOLLOW WARE.****Brilliant Finish.**

No Seams, no Rivets in "Solid-Steel" Ware.

Notwithstanding the claims made by some manufacturers' agents our spiders are made from **Wrought Steel, Without Seams or Rivets** complete, from a single piece of metal. Write for prices.

We manufacture our own goods.



"Solid-Steel" Mason Kettle.

**The Cleveland Stamping & Tool Co., Cleveland, O.****We do Light and Heavy Stamping and Blanking. Also build Dies and Stamping Machinery.****To YOUR Interest !**

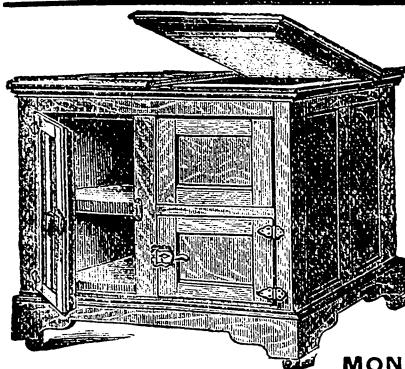
A FAC-SIMILE OF THE ADVERTISEMENT WITHIN THE MARGINAL LINES BELOW WILL APPEAR DURING THE RETAIL SEASON IN MOST OF THE LEADING MAGAZINES AND HOUSEHOLD PUBLICATIONS.

WOULD IT NOT BE TO YOUR INTEREST AS A DEALER TO PREPARE

IN GOOD TIME FOR THE DEMAND THAT WILL THEREBY BE CREATED ?

**As A RULE**

WE SELL BUT ONE DEALER IN A TOWN, AND WILL NOT SELL TO CONSUMERS IN PLACES WHERE OUR GOODS ARE SOLD BY DEALERS, BUT WILL REFER INQUIRIES TO THE DEALERS. WRITE FOR CATALOGUE AND TRADE DISCOUNTS.

**Stoneware Lined Refrigerators**

The superiority of Stoneware Lining in Refrigerators becomes obvious at a glance. It neither sweats nor absorbs moisture and never becomes sour or musty. It is made without open seams; is practically indestructible and is very easily cleaned.

are built upon the best known principles of refrigeration. A perfect circulation of dry, cold air prevents the accumulation of gases and vapor or the mixture of flavors, while the consumption of ice is greatly reduced. The first cost is greater than for ordinary refrigerators but they are far cheaper in the end. If your dealer don't keep them, write for Catalogue. We pay the freight.

MONROE REFRIGERATOR CO.,

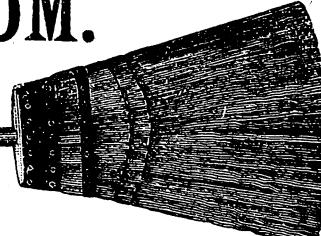
LOCKLAND, OHIO.

**No. 4 RATTAN MIXED BROOM.**

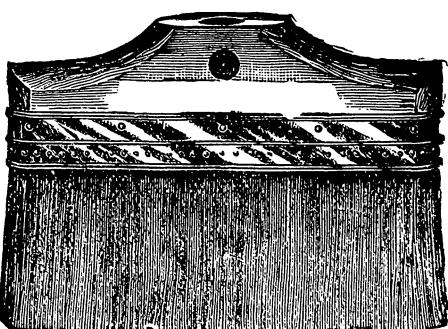
The Best Warehouse, Stable, Shop, Factory and Railroad Broom in the Market.

Made of Broom Corn and Rattan Reed mixed together, flat in shape, with an iron band, as shown in the cut, making it solid, substantial, and stiff, for handling the heaviest dirt. Will last longer than any other similar broom.

Brooms and Brushes for Railroad Shops, Warehouses, Street, Stable, Bloom. Chill, Casting and Moulding purposes a specialty. Write for prices.

**JOSEPH LAY & CO., RIDGEVILLE, IND.****The Utility****Washboard****BRUSHES**

FOR THE



Is a Zinc Board made from best quality No. 6 Zinc, the heaviest and strongest Zinc in use for Washboards.

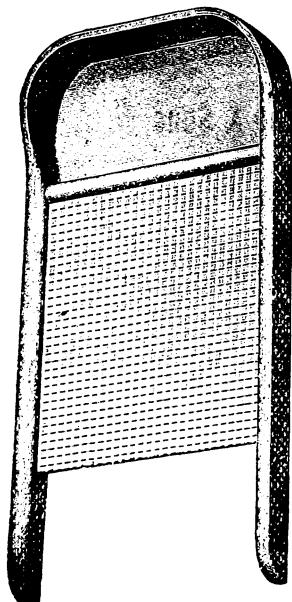
**CRIMP**—The Crimp is our Improved Deep Globe, acknowledged far superior to any now in use on other boards.

**OFFERS**—absolute protection from water at sides as well as the top of the soap board.

**WHY?**—Because being made of one piece which is bent thin and broad at the sides and top of soap board where all splashing occurs, it is impossible in washing to splash over it.

**CONSTRUCTION**—The Board in point of construction excels anything of its kind ever produced. Its lines present a symmetry and regularity pleasing to the eye, and in point of strength is unquestionably superior to any.

**SALES**—Where these are offered for sale competing boards are not "in it."



MANUFACTURED BY

**Olds Wagon Works,**

Fort Wayne, Ind., U. S. A.

**Hardware Trade,**  
Whitewash, Horse, Paint, Window,  
Shoe,

And Every Variety of Brushes and

**Wire Goods.**

Close prices and prompt shipments. Get samples and catalogue for the asking.

**Cincinnati Mfg. Co., Cincinnati, O.**

SUN No. 1080.



Holds 1 lb of Roasted Coffee, which may be ground as needed.

Write for our New Catalogue  
and Revised Prices.

## People Will Talk, You Know— About a Popular Article,

### THE REPUTATION OF COFFEE MILLS

Bearing the "SUN" TRADE-MARK  
IS OUR BEST ADVERTISEMENT.

"THE 'SUN' ONLY SHINES FOR ALL."

OUR NEW LINE AND NEW DESIGNS WITH GENUINE STEEL A-LOY GRINDERS

Are a High Grade Coffee Mill at Popular Prices. We guarantee them Rapid Grinders, and to stand constant use for years. They are mills the seller can warrant with full confidence.

**Do not be confused with the imitation of our goods from a  
PATCHED UP, SECOND-HAND JOB LOT STOCK.**

We cannot afford to sacrifice the confidence of the trade and our own reputation that way. We are manufacturers of all the goods we sell and stake our reputation on their merits.

THE SUN MANUFACTURING CO.,  
Greenfield, Ohio, U. S. A.,

Cash Registers, Money Drawers, Coffee Mills and Wooden Ware Specialties.



For Sifting Flour, Straining and Measuring Fruits, Liquids and many other purposes. Is unquestionably the handiest device ever offered for use in the Culinary Department.

Made at

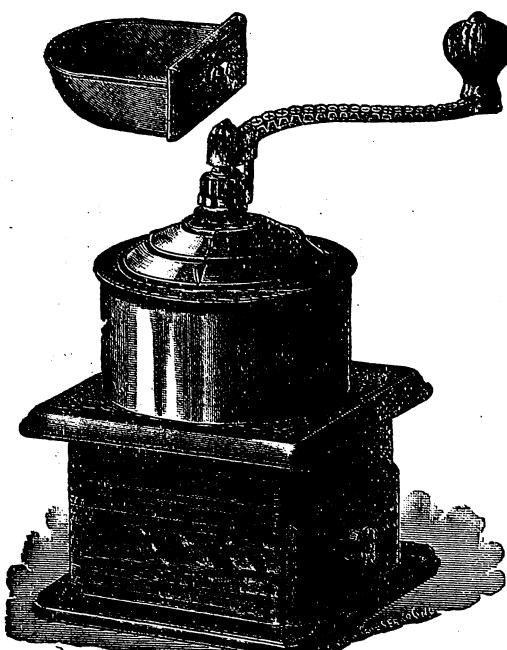
Hamilton, Ohio, by The Fred. J. Meyers Mfg. Co.

F. J. MATTESON, Eastern Ag't, New York.

## This is our— Advertisement No. 2.

We can't show the scarlet enameled canister, burnished brass appearance of the canister and mill cover or the pound of coffee in the canister, but this isn't our fault. In addition to the "Ideal" line of Coffee Mills we are sole manufacturers of "Quick Grinder" Mills formerly made by **THE CHILlicothe MFG. CO.**

We make six patterns of Pound Coffee Mills and thirteen patterns of Box Mills—and go a fishing Saturdays. A drawer of money should sell our No. 2 Money Drawer, which sounds a cathedral gong. This is an improvement over a "chestnut bell." Our cheapest Mills are those using "steel alloy burrs."



No. A10 Ideal Coffee Mill. Holds one pound of roasted coffee.

Waddel Wooden Ware Works, - GREENFIELD, O.

*READING  
HARDWARE  
COMPANY.*

Our productions in Artistic Hardware are unsurpassed for beauty of Designs and Patterns, fineness of Finish and excellence of Material and Workmanship.

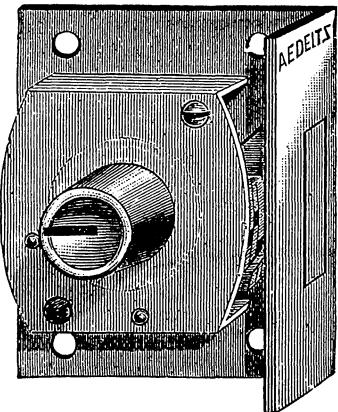
"Vassar" Cylinder Locks are Best and Safest.

NEW YORK, PHILA., CHICAGO.

Factories, *READING, P.A.*



**A. E. DEITZ**



No. 51 Lock.

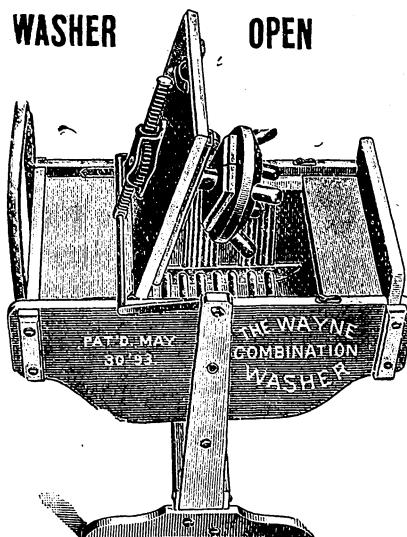
**J. C. McCARTY & CO., Agents,**  
97 Chambers and 81 Reade Sts., New York.

Factory, **BROOKLYN, E. D., N. Y.**

The Iron Age Standard Hardware Lists For Use in Price Books. Compiled by R. R. WILLIAMS, Hardware Editor of *The Iron Age*. These lists are supplied in pamphlet form and are intended to be cut out and inserted in *The Iron Age* Hardware Price Books. For this purpose they are printed on thin and tough paper of the best quality, and prepared with a special view to compactness and convenience of reference. Some of the lists are printed in more than one arrangement, permitting a choice of the best adapted.

For sale by David Williams, 96-102 Reade St., N. Y.

**THE WAYNE Combination WASHER.**



One-third easier than any other machine, takes less water, is the simplest and in all is warranted the best washer of the large family of washers now on the market.

No Dealer Should be Without it.

For Prices and Discounts write

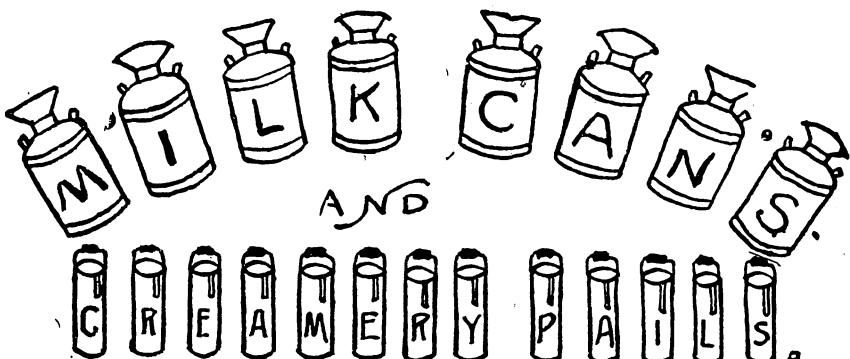
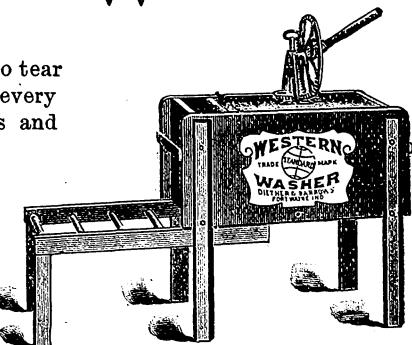
**Anthony Wayne Mfg. Co.,  
FT. WAYNE, IND.**

**The Western Standard Washer**

Is warranted to wash clean, not to tear clothes and to be as represented in every respect. For bottom prices on this and our other first-class washers, address

**Diether & Barrows,**

**FORT WAYNE, IND.**



MILK CANS MADE UP.

MILK CAN STOCK.

CREAMERY MILK CANS MADE UP.

CREAMERY PAIL TRIMMINGS.

**Railroad Milk Cans, City Milk Cans,  
Factory Cans.**

Illustrations and Prices sent upon application.

**SIDNEY SHEPARD & CO.,**  
BUFFALO, N. Y.

Proprietors of the BUFFALO STAMPING WORKS

**C. SIDNEY SHEPARD & CO.,**  
CHICAGO, ILL.

**JONES' PATENT HOSE MENDER.**



Best and Cheapest.

Does not obstruct flow of water. No tools or bands required.

**M. D. JONES & CO.,** Liberal Discount to Dealers.  
368 Washington St., Boston.

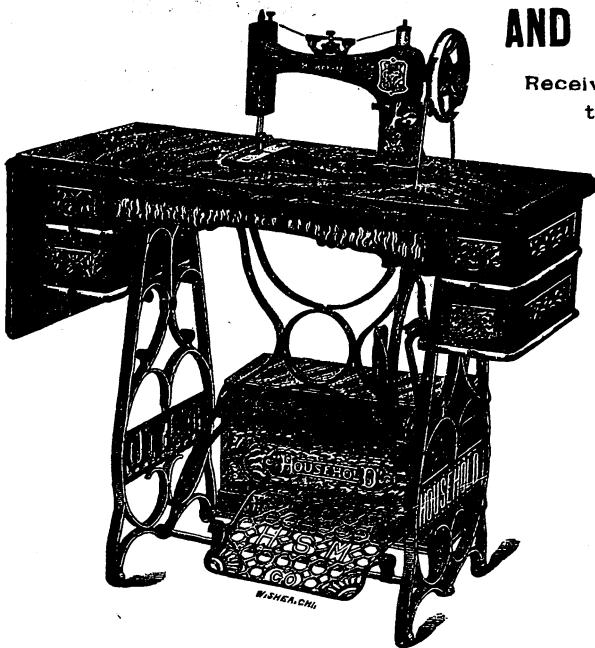


JONES' IMPROVED MENDER AS APPLIED.

HOSE HOSE

THE EASY RUNNING

# "HOUSEHOLD" SEWING MACHINE AND ATTACHMENTS

Received Highest Award at  
the World's Fair.

Unequaled for  
Capacity, Simplicity, Durability and  
Modern Construction.

It is the Best  
Sewing Machine in  
the World.

Dealers wanted  
in all unoccupied  
territory.

## Household Sewing Machine Company,

PROVIDENCE, R. I.

9 East 14th Street,  
NEW YORK.40 West Street,  
BOSTON.141 Lake Street,  
CHICAGO.

THESE ARE "STIRRING" TIMES. - - -

"IT'S A COLD DAY"  
WHEN A GOOD FREEZER IS NOT WANTED.

**THE "OHIO"**  
ICE CREAM FREEZER  
STIRS: FROM: THE: BOTTOM.  
HAS ALL NEEDED MOTIONS.—NO MORE.

Has all the good points.

None of the bad. - - -

SAMPLE on approval to responsible dealers,  
express prepaid, east of Kansas City.

MADE IN ALL THE SIZES.

—MANUFACTURED BY—

The Sam'l C. Tatum Co.,  
No. 264 Water St., Cincinnati, Ohio.

## Hudson's Garden Hose Mender

So Simple a Child Can Use It.

Made in three sizes, for  $\frac{1}{2}$  in.,  $\frac{3}{4}$  in. and 1 in. hose.

Put up in Boxes for Family use.

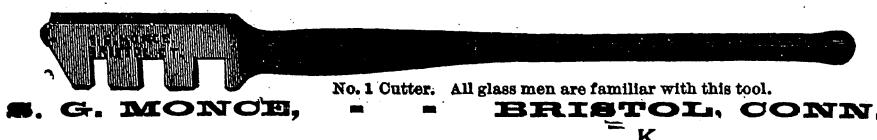
EACH BOX CONTAINS:

1 Pair Pliers,  
20 Bands,  
6 Tubes.

Sells readily at 75 cents.  
Liberal discount to Dealers.  
Send for Full Description.

C. E. HUDSON &amp; CO., Manufacturers, Leominster, Mass.

MONCE'S NOVELTY GLASS CUTTERS.—INTERCHANGEABLE LOCK STENCILS



No. 1 Cutter. All glass men are familiar with this tool.

S. G. MONCE,

— BRISTOL, CONN.

K

## You ought to.

A GREAT many merchants are using  
**Ladd's Discount Book.**

Every day adds to the number of those  
who highly esteem this valuable work.  
Very many people both in America and  
abroad have commended it highly as a  
time-saver and money-earner. It is  
positively

**Accurate**, Saving many times its  
cost in preventing errors.

**Rapid**, = = Saving much valuable  
time, and "Time is  
Money."

**Practical**, As proved by its con-  
stant use by those who  
would not now do with-  
out it.

The cost is small, the book will  
last for years, you can depend upon  
the results without proving.

A great many bright people are us-  
ing LADD'S DISCOUNT Book, and

## You ought to.

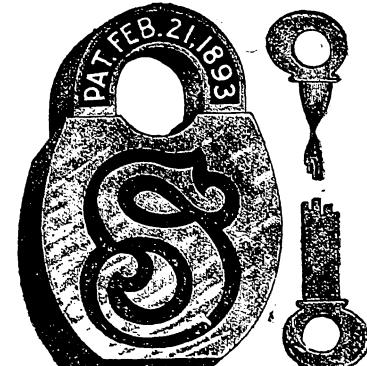
Regular Edition, \$3.00 } Sent postpaid  
Double Indexed, 4.00 } upon receipt  
of price by

DAVID WILLIAMS,

Publisher and Bookseller,

96-102 Reade Street, - New York.

## THE SCHULTZE LOCK UNPICKABLE.



SEND FOR CIRCULAR.

MANUFACTURED ONLY BY

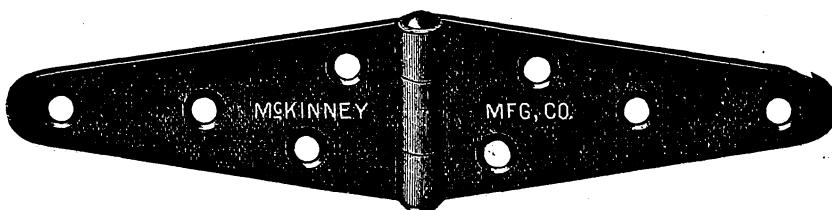
**The Schultze Mfg. Co.,**  
Cor. Emerald & Wishart Sts., Phila., Pa.

# STEEL HINGES AND BUTTS.

—STANDARD GOODS.—

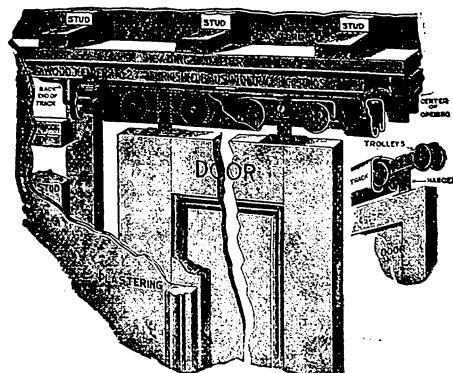
McKINNEY MFG. CO. - ALLEGHENY, PENN.

SEND FOR  
LIST.



ORDERS FILLED  
ON SIGHT.

“NONE BETTER.”



## PARLOR DOOR HANGERS

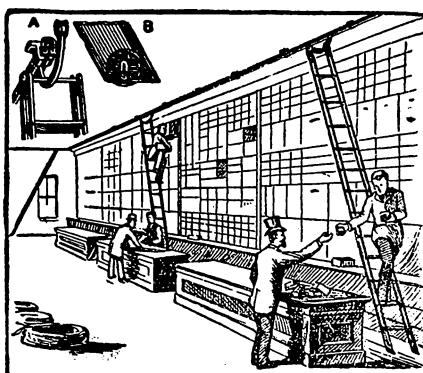
The adjustment is in the Track and not in the Hanger, as in other fixtures.  
Track can be taken out of Pocket and replaced without defacing walls after house is finished.

**HIGHEST AWARD  
AT WORLD'S FAIR 1893,**  
—: ON :—

Parlor, Barn and Fire Door Hangers  
SEND FOR CATALOGUE.

COBURN TROLLEY TRACK MFG. CO.,  
HOLYOKE, MASS.

We make four styles of Rolling Ladders to  
reach shelving of any height.



# P. & F. CORBIN,

New Britain, Conn.

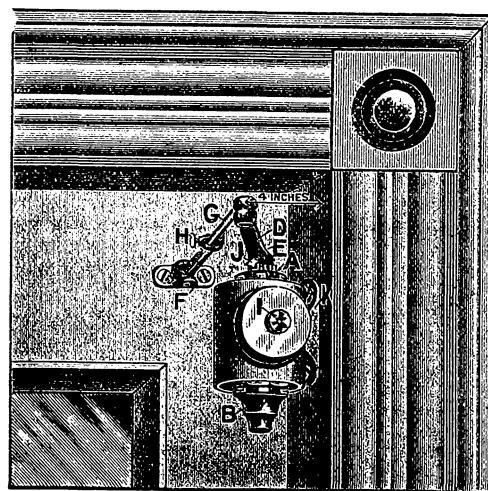
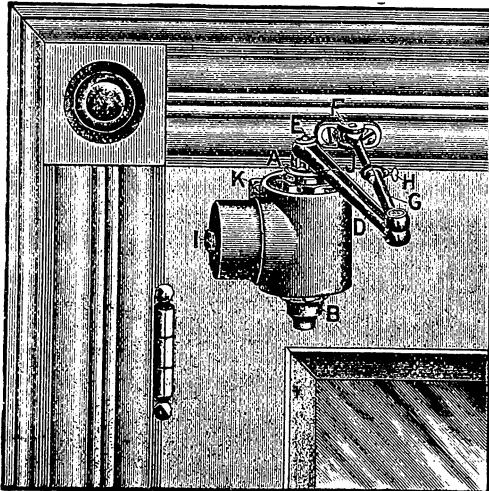
New York.

Philadelphia.

Chicago.

—) MANUFACTURERS OF ( —

Easily  
Adjusted  
and Adapted  
for all  
Requirements.



Looks Well,  
Acts Well,  
Wears Well.

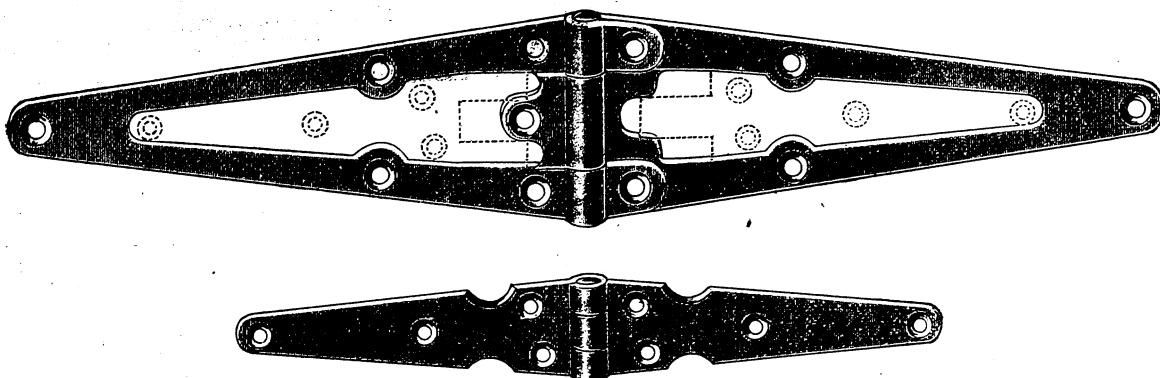
# LIQUID DOOR CHECKS AND SPRINGS,

Fine Builders' Hardware. Wood and Machine Screws.

Catalogues and Prices Furnished on Application.

**SOMETHING NEW**

—IN—

**Strap and T Hinges.**

The Chicago Wrought Butt and Hinge Co., organized for the purpose of manufacturing Steel Hinges, is now at work getting out the necessary tools and machinery for making a line of Strap and T Hinges as shown in above cuts.

It is apparent that this style of hinge shows

**Greater Economy in the Use of Steel**

than any other hinge ever manufactured, and consequently can be **sold at a low price.**

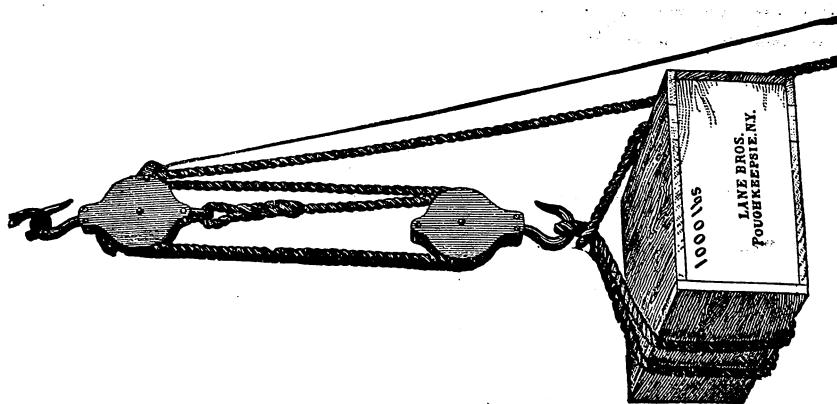
A careful investigation shows that the breaking point of an ordinary hinge is the joint. In the hinges illustrated above

**THE JOINT IS RE-INFORCED,**

while enough material is left in the strap to easily bear any strain to which it would be subjected in practical use.

••••

**CORRESPONDENCE SOLICITED.****ADDRESS****THE CHICAGO WROUGHT BUTT & HINGE CO.,****P. O. Box 907.****CHICAGO, ILL.**



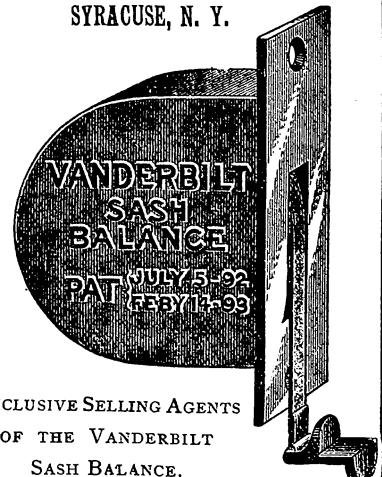
## LANE'S SELF-LOCKING TACKLE BLOCKS

Anti-Friction Steel Bushings,  
Holds the load at any point, and always sure.  
SEND FOR CIRCULAR.  
For sale by the Hardware trade.

MANUFACTURED BY

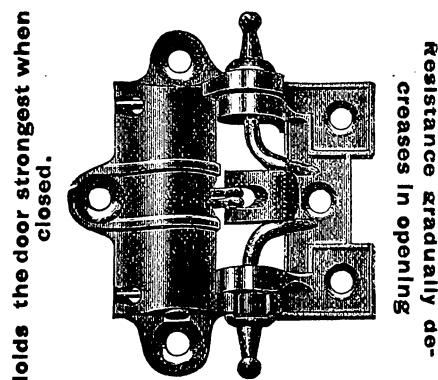
**LANE BROS.**  
POUGHKEEPSIE, N. Y.

**E. C. STEARNS & CO.,**  
SYRACUSE, N. Y.



EXCLUSIVE SELLING AGENTS  
OF THE VANDERBILT  
SASH BALANCE.

**NEW IDEA SPRING HINGE**



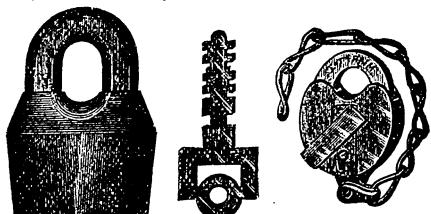
and Increases in closing the door.

A covered (patented) hold-back Spring Hinge. Full particulars, free Sample and Prices by mentioning this paper.

**STOVER MANUFACTURING CO.,**  
145 River St., Freeport, Ill.

ESTABLISHED 1879.

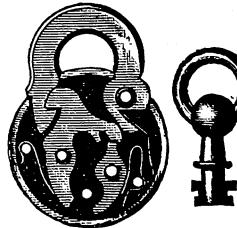
**KEYSTONE LOCK WORKS,**  
E. T. FRAIM, Lancaster, Pa., U. S. A.



Originators, designers, patentees and manufacturers of all the leading popular styles of **PADLOCKS**, Key-Locking Scandinavian with our patent Inter-Locking Tumblers; the only reliable lock of this style ever made. **SELF-LOCKING** Scandinavian of the highest type of perfection. Dust Proof Railroad, Freight Car and Switch Padlocks. Brass, Bronze, Steel and Malleable Iron Padlocks for all purposes and in all finishes. 131 different kinds. Write for our new 100-page catalogue.

**SURPLESS, DUNN & ALDER.** General Agents,  
97 Chambers St., NEW YORK.

## PATENT PERFECTION PADLOCK.



*Eight Tumblers, Key Turning Both Ways.*

Sizes,  $\frac{3}{4}$  inch to  $2\frac{1}{4}$  inches, of cast bronze. Defies competition for quality and price. No steel or iron used, cannot rust, and cannot be picked. Also,  $\frac{1}{4}$  and  $\frac{5}{8}$  inch Padlocks, opened with a common pin, in brass and nickel, for cats and small dogs. The best Railroad Switch and Car Lock in the world. Adopted by the United States Treasury for bonded warehouses.

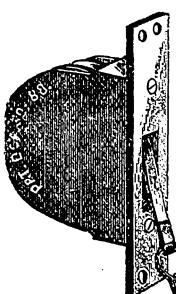
**AMES SWORD CO., Chicopee, Mass.**

Send for Price-Lists and Circulars.

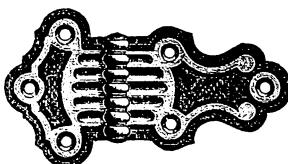
## DOES IT PAY?

To buy an inferior article, which your trade condemns, when you can get

## THE CALDWELL SASH BALANCE.



**CALDWELL MFG. CO., Rochester, N. Y.**



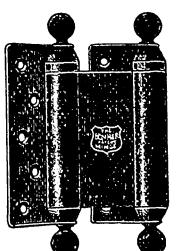
## CORRUGATED WROUGHT BRASS HINGES, FOR REFRIGERATORS, ETC.

Original and Striking Designs in a Great Variety of Finishes.

SEND FOR PRICE-LIST.

## THE STANLEY WORKS,

NEW BRITAIN, CONN.,  
79 CHAMBERS STREET, N. Y.



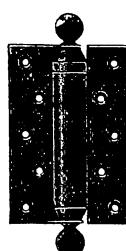
### THE BOMMER PATENT COMPOUND SPIRAL SPRING HINGES

Are Made of

### WROUGHT STEEL, BRONZE AND BRASS.

Also of cast metal in all the finishes known to the trade.

**BOMMER BROTHERS,**  
351 and 353 Jay Street, - - BROOKLYN, N. Y.



## THE CLARK MFG. CO.,

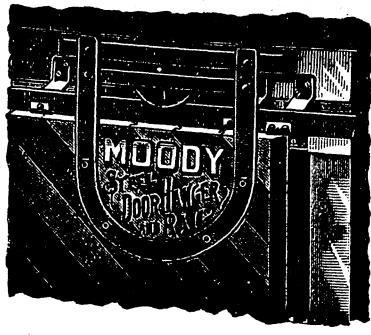
Blind Hinges, Gate Hinges, Door Butts,  
And other HARDWARE SPECIALTIES,  
BUFFALO, N. Y.

## BOOKS.

YOU CAN OBTAIN PROMPTLY the latest  
work on any subject in which you are interested  
by addressing DAVID WILLIAMS, Publisher  
and Bookseller, 96-102 Reade Street, New York.

VICTOR MFG. CO., Newburyport, Mass.

## STEEL RAIL.



Showing one-half set of hangers attached to door.



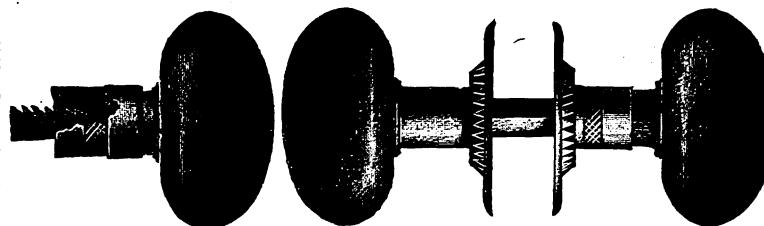
The Only Bracing Bracket Made.

## HANGERS.

	Per Doz. pr.
No. 5, to run 6 feet, 2½ in. wheel,	\$10.00
No. 6, to run 10 feet, 4½ in. wheel,	15.00
No. 7, to run 15 feet, 5½ in. wheel,	22.00
RAIL, per foot.....	6½ cents.

## PRICE-LIST.

Sectional cut showing construction of Knob.



Half size cut of Knob as applied to door. No side screws or adjusting washers.

Don't you want your stock to represent the latest and most improved up to date Hardware? The Whipple Patent Door Knob is the latest and best Door Knob attachment ever made. Give it a trial.

PERRY &amp; WHIPPLE CO., New Haven, Conn.

New York Sales Agent, E. G. SHEPARD, 142 Chambers Street.

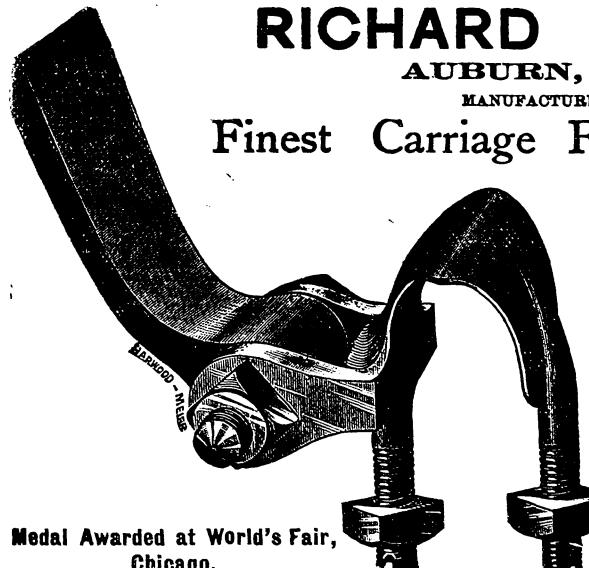
## SASH WEIGHTS!

NORTON BROTHERS,

Manufacturers,

Office: 813 Masonic Temple, CHICAGO.

WORKS AT MAYWOOD, ILL.

Medal Awarded at World's Fair,  
Chicago.Send for New Catalogue for  
Season 1893-94

## WHY USE WOODEN OR HEAVY STEEL BLOCKS

WHEN THE STEEL AND IRON

## TACKLE BLOCKS

MADE BY

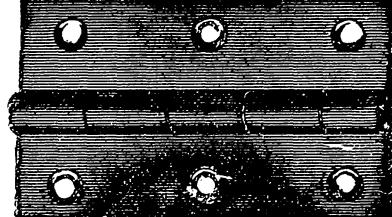
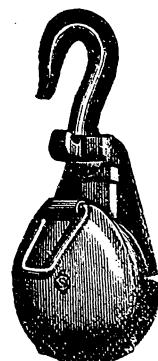
The Cleveland Block Co.,

CLEVELAND, OHIO, U. S. A.,

ARE BETTER IN EVERY WAY.

No waste material. Every ounce of weight in the line of strength. No clumsy outside straps or bolts. As light as wooden blocks and vastly more durable. They wear, but never break. Sheaves interchangeable.

General Agents: Topping Brothers, 92 Chambers Street, New York.  
New England Agents: - Dodge, Haley & Co., 212 High Street, Boston.



## Cast Brass Butt Hinges

IN STOCK AND FOR SALE BY

W. &amp; J. TIEBOUT,

Nos. 16 &amp; 18 Chambers Street, New York,

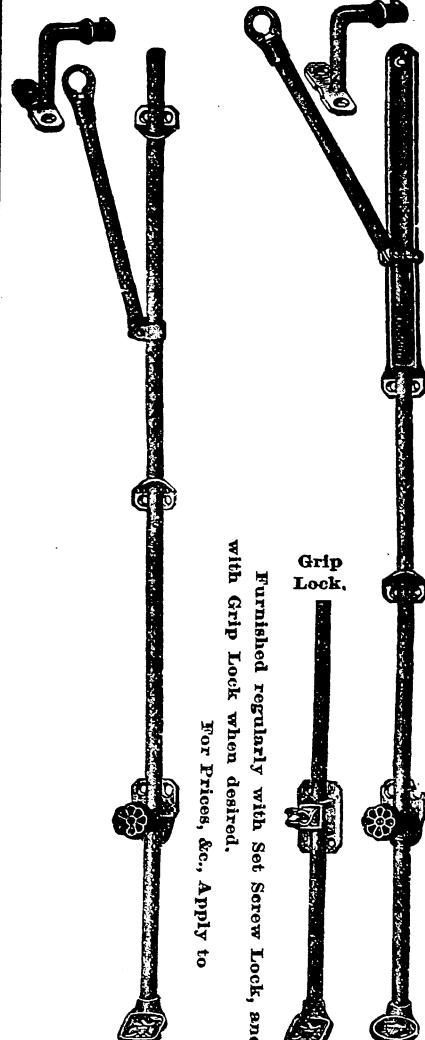
MANUFACTURERS OF

BRASS, GALVANIZED & SHIP CHANDLERY  
HARDWARE.

## TRANSOMLIFTERS

"EAGLE."

"SHIELD."

With Grip Lock when desired.  
For Prices, &c., apply to  
Furnished regularly with Set Screw Lock, andGrip  
Lock.

J. F. WOLLENSAK, PATENTEE

CHICAGO, ILLINOIS.

THE WILCOX & HOWE COMPANY,  
BIRMINGHAM, CONN.,

MANUFACTURERS OF

A Full Line of Carriage Hardware  
ALSO SPECIAL FORGINGS.

Estimates cheerfully given. Send for Catalogue

## SASH WEIGHTS

E. E. BROWN &amp; CO.,

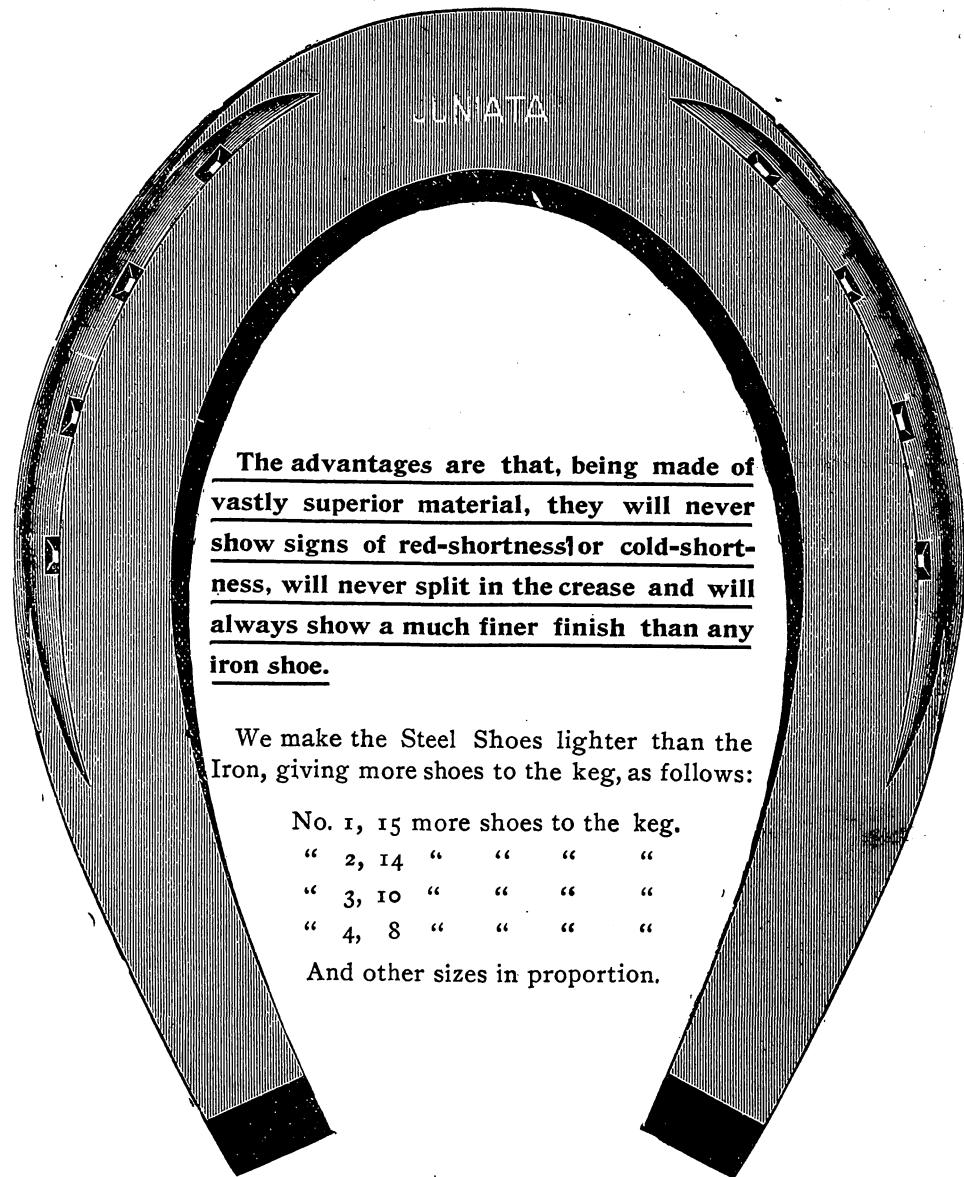
McKean and Meadow Sts.,

PHILADELPHIA, PA.

# STEEL HORSE SHOES.

## SHOENBERGER & CO., PITTSBURGH, PA.,

After numerous and costly experiments have succeeded in manufacturing a special quality of soft homogeneous steel, specially adapted to the manufacture of Horse and Mule Shoes, and are now making from this steel Extra Swaged, and Government Pattern Horse and Mule Shoes. They give the best of satisfaction everywhere and we furnish them to the trade at the same prices as the regular iron shoe sold by ourselves and our competitors. We are at present making our Roadster Pattern Horse Shoes out of Iron, but we will make them of Steel also within a short time.



We make the Steel Shoes lighter than the Iron, giving more shoes to the keg, as follows:

No. 1, 15 more shoes to the keg.

" 2, 14 " " " "

" 3, 10 " " " "

" 4, 8 " " " "

And other sizes in proportion.

### No. 2 EXTRA SWAGED FRONT.

We also beg to say that we have introduced improved machinery into our new factory and have doubled our capacity, and are now prepared to furnish the best shoe, either iron or steel, ever offered to the trade.

We would also call your attention to our Improved Steel Toe Calk, equal to any in the market. To secure the best wearing qualities use sand or borax in welding on a calk and cool off at a dark red, or still better, cool off without plunging in water. We make sizes numbers 1, 2, 3, 4, 5 and 6, packed in 25-pound boxes.

Write to us for information and prices, or apply to jobbers and dealers, who sell them everywhere.

## SHOENBERGER & CO.,

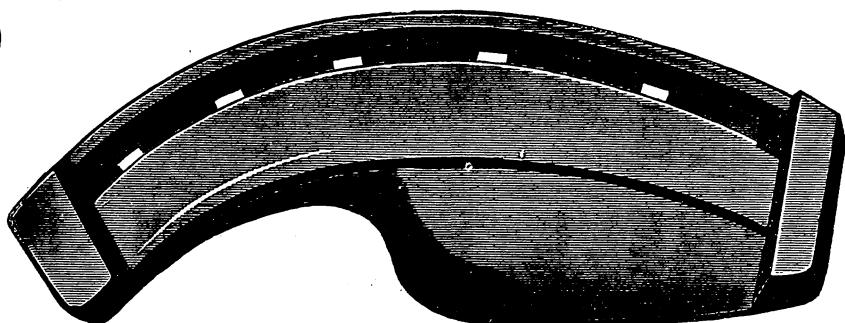
JUNIATA IRON AND STEEL WORKS, - - - PITTSBURGH, PA.

**SCRANTON FORGING CO.,**  
SCRANTON, PA  
**CARRIAGE HARDWARE AND**  
**SPECIAL DROP FORGINGS.**

FORGED

OX

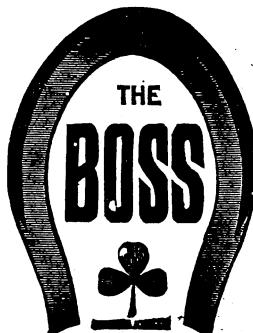
SHOES.



Made under Deeble's Patent, Aug. 9, 1887.

Our 1891 pattern is a modification of the style we have made for the past four years, giving additional strength to the web.

IT IS JUST RIGHT.



**HORSE AND MULE SHOES.**

Superior Quality, Shape and Finish.

**BRYDEN HORSE SHOE CO.,**

CATASAUQUA, PA.

**RHODE ISLAND PERKINS HORSE SHOE CO.,**

MANUFACTURERS OF

**Horse and Mule Shoes of the Perkins Pattern.**

SPECIALTIES - X L Steel Shoes, Toe Weight Shoes and Goodenough Shoes.

Works at Valley Falls, R. I. Office, 31 Exchange Place, Providence, R. I.

F. W. CARPENTER, Pres. O. H. PERKINS, Gen. Manager. R. W. COMSTOCK, Secy.

J. C. McCARTY & CO., Agents - 97 Chambers Street, New York.

**THE NEW DIAMOND STATE HORSE AND MULE SHOES.**

JUST TRY THEM and YOU will say they excel all others.

MANUFACTURED BY

**DIAMOND STATE IRON CO.**

WILMINGTON, DELAWARE.

Other "high grade" specialties in Rivets, Spikes, Splice Bars, Track and Machine Bolts, Blank Nuts, Stay Bolt Iron, Horse Shoe Iron, Bar Iron, &c.

PHILADELPHIA OFFICE, 206 So. Fourth St. Correspondence invited NEW YORK OFFICE, 11 Pine St.



**Covert Pants Stretcher.**

THE Covert "Pants Stretcher" will restore the pants to their original shape and length.

It removes all WRINKLES and BAGGING AT THE KNEES, giving them the appearance of having just left the tailor's hands.

It also holds the pants in a convenient position for brushing and cleaning.

The Stretcher cannot get out of order, and can be adjusted in the pants in a few seconds.

It being applied inside the pants, it obviates all objections prominent in other stretchers.

It is made of steel wire, and being in sections can be packed in a valise when traveling. Sold by the trade, or

Sample pair sent by mail to any address, free of postage, on receipt of \$1.00.

MANUFACTURED ONLY BY

**COVERT MFG. CO., West Troy, N.Y.**



**BURDEN'S HORSE SHOES.**

"Burden Best"

Iron

Boiler Rivets.

**The Burden Iron Co.**

TROY, N.Y.

**PHOENIX HORSE SHOES.**

**PHOENIX HORSE SHOE CO.,**

ROLLING MILLS AND FACTORIES,

Poughkeepsie, N.Y.

Joliet, Ill.

NEW YORK OFFICE, No. 66 Reade St.

**Standard Horse Shoe Co.,**

Manufacturers of

**HORSE AND MULE SHOES.**

LEEDS, ROBINSON & CO., General Agents,

4 Liberty Square. Boston, Mass.



"The Best  
Driving  
Nail."

HIGHEST AWARD  
—AT—  
World's Columbian Exposition.

In the tests submitted before the judges on awards  
the Capewell No. 6 was shown to be 17 per cent. tougher  
than No. 8 of other makes.

**CAPEWELL HORSE NAILS,**  
MADE BY  
**THE CAPEWELL HORSE NAIL CO., - - - HARTFORD, CONN.**

Office of D. G. BURNHAM,  
Director of Works, World's Columbian Exposition,  
JACKSON PARK, CHICAGO, ILL.

October 28, 1893.

To THE CAPEWELL HORSE NAIL Co.:  
Gentlemen—I have used your horse nails here on the horses belonging  
to the World's Columbian Exposition, and I think they are far su-  
perior to any others that I have ever used. As I have been in the  
horseshoeing business for about twenty-five years, I know  
what I am talking about.  
Very respectfully,  
HERMAN J. HENKE,  
Foreman Blacksmith, World's Colum-  
bian Exposition.

The  
Capewell  
Patent  
Corrugated  
Horse Nail.

Needs  
No  
Clinching.

# Highest Award

---

FOR  
Supreme Excellence

---

TO  
The **PUTNAM** Hot-Forged and

---

Hammer-Pointed Horse **NAILS**,



At the *World's Columbian Exposition* at Chicago. A medal and diploma worded :

"Supreme excellence in material, method in manufacture, and quality of finished product; elasticity  
and smoothness combined with holding power in clinch.  
It allows the use of very small nails."

There is nothing beyond "supreme excellence," nor is there anything comprised in a horse nail, except the "material from which it is made," "the method of manufacture," and "quality of finished product." Putnam nails, by their "elasticity," give slightly to the expansion and contraction of the hoof while the horse is in motion; by their "smoothness," do not enlarge the nail holes in the hoof, while their "supreme excellence," in "holding power in the clinch," enables them to hold the shoe in the hardest service until worn out.

By the "use of small nails," large holes are avoided and money saved to the smith.

Thus it will be seen that the officials of the *World's Columbian Exposition* recognize what qualities go to make up a good horse nail and that only the "Putnam" contains them all.

**PUTNAM NAIL CO.,**  
Neponset, Boston, Mass.

# H. D. SMITH & CO..

Plantsville, Conn.,

MANUFACTURERS OF THE BEST QUALITY

## CARRIAGE MAKERS' HARDWARE,

MANUFACTURE THE LARGEST VARIETY OF

## FORGED CARRIAGE IRONS

Of Best Material and Workmanship.

Send for Price and Illustrated List of

## CHAMPLAIN

Manufactured by the NATIONAL HORSE NAIL CO.,  
VERGENNES, VERMONT.

All Sizes. All Patterns. All Warranted. Sold Everywhere.

J. C. McCARTY & CO., Agents, New York.



Elegant Iron.

Beautiful Shape.

HORSE SHOES,  
Light, Medium and Heavy.

MULE SHOES,  
Light, Medium and Heavy.

Illustrated booklet and prices to all  
parts of the world on application.

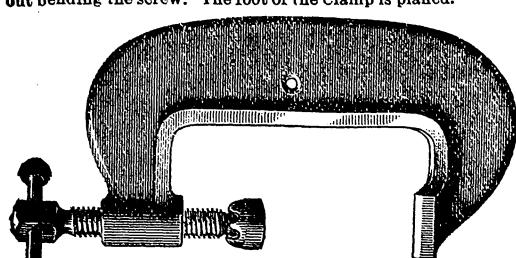
OLD DOMINION IRON AND NAIL WORKS CO.,  
ARTHUR B. CLARKE, President.

Chicago Office, 45 La Salle St.

Richmond, Va., U. S. A.

### LE COUNT'S HEAVY STEEL CLAMP.

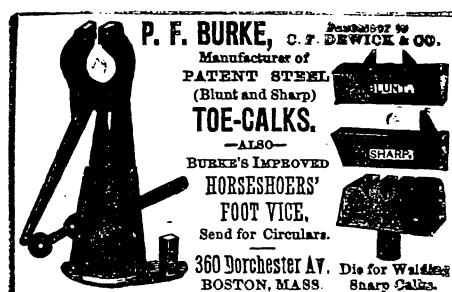
Extra heavy, with Button on end of screw, hung on a ball so as to accommodate itself to irregularities with  
out bending the screw. The foot of the Clamp is planed.



The Screws of all the Clamps are made to reach the lower number.

SEND FOR CATALOGUE OF FULL LINE OF MACHINISTS' TOOLS.

C. W. LE COUNT, MANUFACTURER. SO. NORWALK, CONN., U. S. A.  
These goods are for sale by CHAS. CHURCHILL & CO., Ltd., 21 Cross St., London, England.



Crescent  
Horse and Mule Shoes,

BAR IRON.

CRESCENT HORSE SHOE IRON CO.

Max Meadows, Va.



FROST'S ANTI-RATTLER

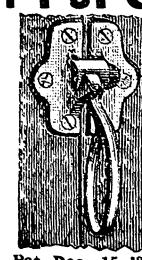
Pat. Jan. 20, 1880.

Cut One-half Size.  
Sample pair sent to any hardware or saddlery firm by addressing

The Frost Hill Spring Co.,  
Boston, Mass.

P. J. Conroy & Co.,  
Paschal, PHILADELPHIA.

"CONROY"  
Refrigerator Door  
Fasteners



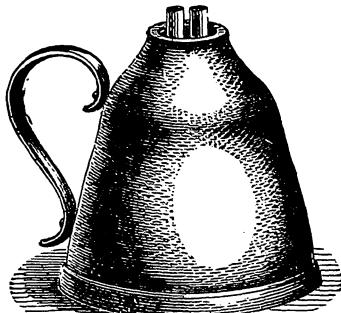
Have rapidly supplanted all  
others.

Refrigerator Trimmings.

# BUFFALO SCALE CO., Buffalo, N. Y. SCALES OF ALL KINDS.

PATENTED ARTICLES  
OF  
Malleable Iron.

Hammer's Malleable Iron Hand Lamps.



SCREW, KEROSENE SIZE.

Hammer's Adjustable Clamps.

Hammer's Malleable Iron Oilers, 3 Sizes

Hammer's M. I. Hanging Lamps.

NEW pattern Heavy Screw Clamps, strongest in the Market.

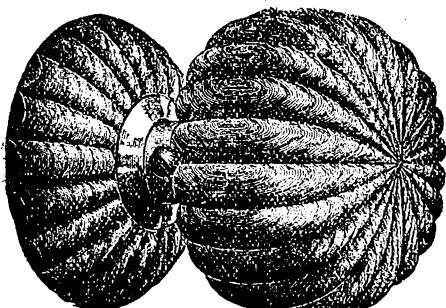
For sale by all the principal Hardware Dealers.

Send for Price List.

## MALEABLE IRON CASTINGS

Of superior quality, and Hardware Specialties in Maleable Iron made to order.

**HAMMER & CO.**  
BRANFORD, CONN.



WOOD DOOR KNOBS,  
DOOR SPRINGS AND CHECKS  
AND CHECKING SPRING HINGES.

NEW GOODS. NEW PRICES.

Send for New Price-List.

J. BARDSEY, 149 & 151 Baxter St. New York.

## HARDWARE DEALERS

CAN RECOMMEND THE

## CHAMPION METAL WINDOW SASH CHAINS

to their customers as a reliable substitute for Sash Cords, very strong and lasting (some in daily use ten years), and gives thorough satisfaction wherever used. The patented attachments are very simple and can be applied to any window.

MANUFACTURED ONLY BY

## "THOMAS MORTON,"

65 Elizabeth Street,

Write for Prices. NEW YORK.

The Practical Polish and Varnish Maker.  
By H. C. STANDAGE. A treatise containing 750 receipts and formulae for the manufacture of varnishes, polishes, &c. 12mo, cloth.....\$2.50  
For Sale by DAVID WILLIAMS, 96-102 Reade St., N.Y.



This Wrench can be Furnished with long Nut or Sleeve.

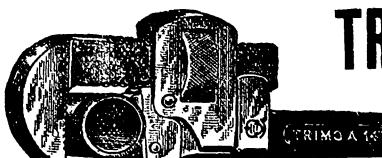
COMBINATION WRENCH.

Case-Hardened Throughout.

Parts Interchangeable

This wrench not only combines the superior qualities of a Gas Pipe Wrench but also all the requisite combinations of a regular Nut Wrench, thus making a combination which has no equal. For Circulars and Price-List, address

**BEMIS & CALL HARDWARE & TOOL CO., Springfield, Mass., U. S. A.**



## TRIMO PIPE WRENCH,

Forged Steel.

All parts interchangeable.

Grips firmly without loss of motion. Releases readily. Never locks. Causes no trouble in close quarters. Does not crush the pipe.

TRIMO

CHAIN

PIPE

WRENCH.



Superior in strength and ease of operation. COMPLETE circular grip. Never slips nor crushes.

Can be used with one hand and in closer quarters than any other Basin Wrench. Parts Interchangeable.



TRIMO  
BASIN WRENCH.

**TRIMONT MFG. CO.,** ROXBURY  
MASS.

J. H. WILLIAMS & CO., 9-15 Richards Street,  
BROOKLYN, N. Y.

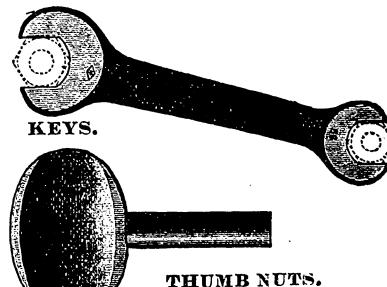


Iron, Steel, Copper

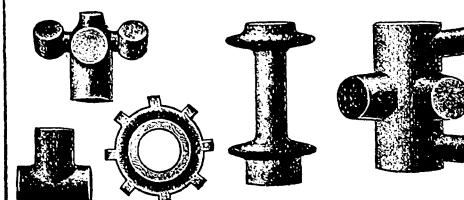
and Bronze

DROP-FORGINGS.

Track Wrenches.



THUMB NUTS.  
COLLARS.



**WYMAN & GORDON**  
WORCESTER, MASS.  
DROP FORGINGS

## Screw Plates and Dies.

Drop Forged  
from the



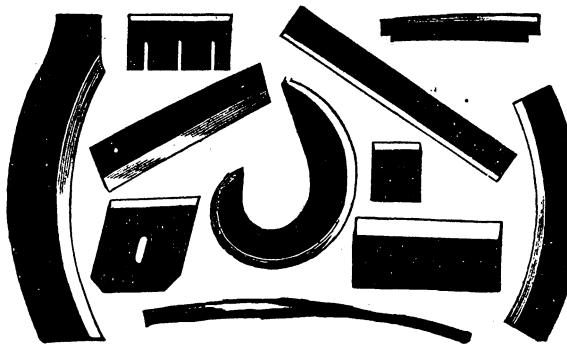
Best Bar  
Steel.

These Screw Plates have a new and novel arrangement for holding the dies, making them the most convenient tool of this kind made.

**THE BILLINGS & SPENCER CO.**

Hartford, Conn.

Drop Forgings of Every Description.



## LORING COES &amp; CO.

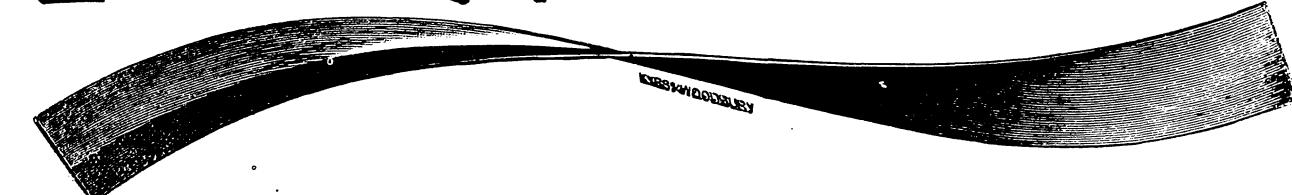
WORCESTER, MASS.

## Manufacturers of MACHINE KNIVES.

Shear Blades and Strips, Moulding Cutter Plate, Die Stock for Leather, Cloth and Paper Cutting Dies. Lawn Mower and Hay Cutter Knives of every description.

End view of Plated Stock for Dies, Lawn Mower Knives, Blades Etc., showing how the Steel is laid.

KERSHAW COES

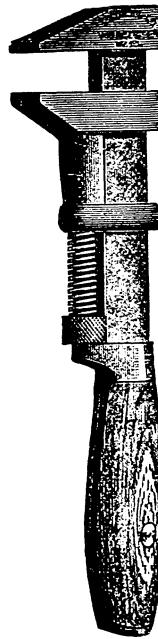
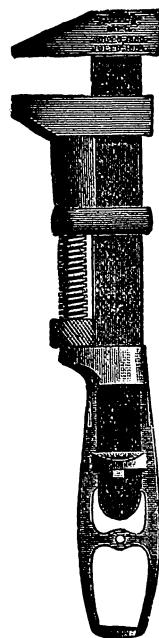


## L. COES'

Genuine Improved  
KNIFE HANDLE  
PATENT

Screw  
Wrenches

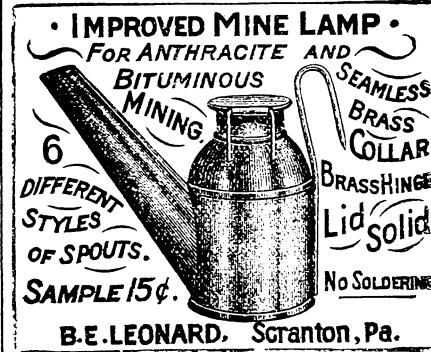
MANUFACTURED BY  
COES WRENCH CO.,  
WORCESTER, MASS.



Sectional View Illustrates our New Knife Handle, showing Malleable Iron Frame and Shank of Bar keyed into position.

STRAIGHT BAR, EXTRA LONG NUT FOR SCREW IN JAW. ED  
The BEST MADE and STRONGEST WRENCH in the MARKET.

J. C. McCARTY & CO., } New York Agents.  
JOHN H. GRAHAM & CO., }

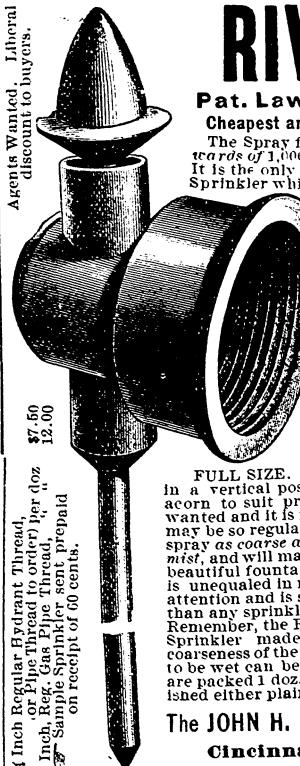


B.E. LEONARD, Scranton, Pa.

## RIVAL

Pat. Law Sprinkle  
Cheapest and Best in Use.

The Spray from it covers upwards of 1,000 sq. feet of lawn. It is the only patent adjustable Sprinkler which is adaptable to any water pressure. Being made of brass, and having no revolving parts to wear out, or small openings to clog up, it can be operated with sandy or muddy water as well as clear, and will last for years. To operate, screw Sprinkler on end of hose, stick therod in



FULL SIZE. To the ground in a vertical position, adjust the acorn to suit pressure, and spray wanted and it is ready for use. It may be so regulated as to throw a spray as coarse as rain or as fine as mist, and will make one of the most beautiful fountains imaginable. It is unequalled in merit, requires no attention and is sold at a less price than any sprinkler in the market. Remember, the RIVAL is the only Sprinkler made by which the coarseness of the spray and the area to be wet can be regulated. They are packed 1 doz. in a box, and finished either plain or nickel plated.

The JOHN H. McGOWAN CO.  
Cincinnati, Ohio.

## STAR MANUFACTURING CO..

Carpentersville, Kane Co., Ill.

MANUFACTURERS OF



## PLOW SHARES.

Plow Moldboards,  
Landside Plates,  
Landside Points.

Lister Shares, Fin Cutters, Cultivator Shovels, Cultivator Shovel Points, Plow Points, Screw Coulter Hubs.

Mention IRON AGE.

## THE TOPLIFF &amp; ELY CO..

MAKERS.

BUCK  
"I"  
PRUNER

ELYRIA, OHIO.

Every Pair Warranted.  
Liberal Discount to  
Trade.



## COLDWELL

AWN MOWER CO..

Newburgh, N. Y.

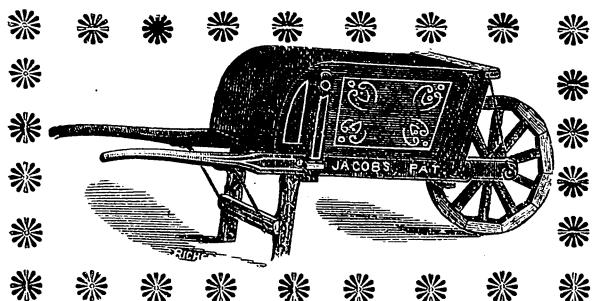
## THE BEST MOWER MADE.

The Lightest Running Mower in the World.

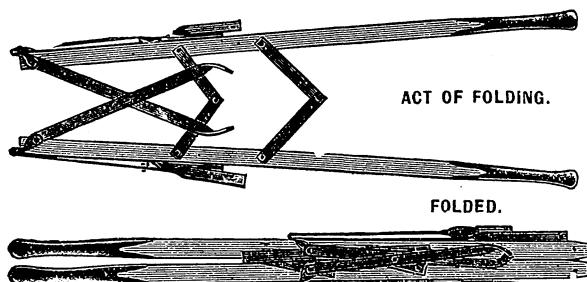
This is the only Lawn Mower that stood the test of working the entire season on the Columbian Exposition Grounds without any repairs.

# Farm and Garden

Barrows as made by us are peculiarly adapted to the uses such vehicles are put to. They are exceedingly light and yet strong in all parts, and are made in an infinite variety of styles and sizes to suit all requirements. If you will ask for our complete catalogue, it will show a line of goods you cannot afford to be without.

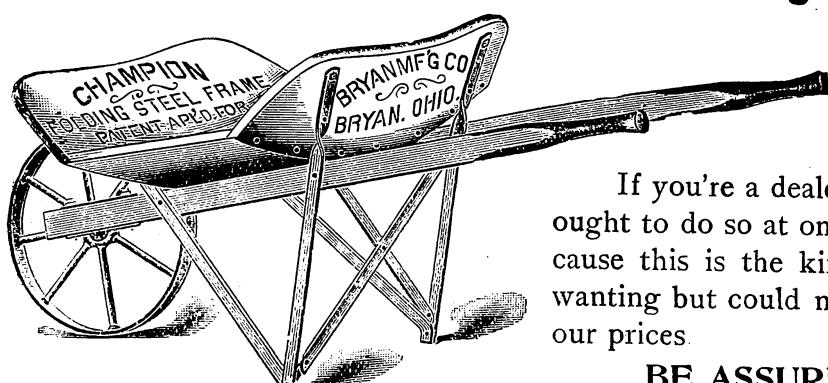


The  
Kilbourne & Jacobs Mfg. Co.,  
COLUMBUS, O.



## The Champion

Folding Steel Frame Barrow  
Beats 'Em All.



If you're a dealer and haven't ordered a sample you ought to do so at once. It's money in your pocket, because this is the kind of barrow your customer's been wanting but could never get. Write us anyway and get our prices.

BE ASSURED IT WILL PAY YOU.

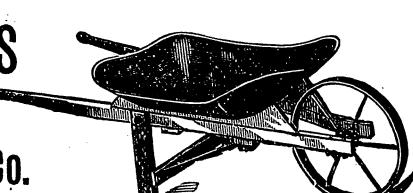
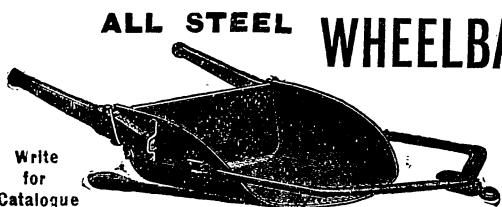
ALL STEEL

## WHEELBARROWS & SCRAPERS

MANUFACTURED BY

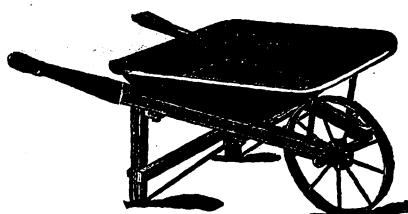
AMERICAN STEEL SCRAPER CO.  
104 Court Street, SIDNEY, O.

Write  
for  
Catalogue



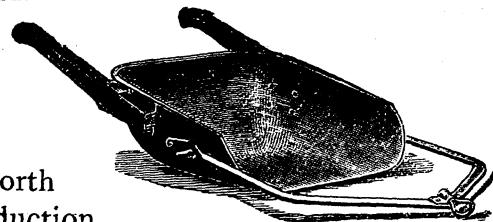
# ONE MOMENT.

Have you bought your spring stock?



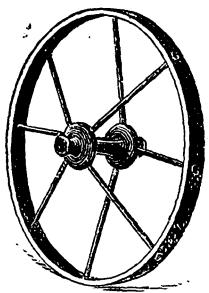
If not don't you think it worth while to investigate our production before doing so? We can and will make it interesting to you if you will write us.

**Sidney Steel Scraper Co.** 924 Poplar Street,  
SIDNEY, OHIO.



## Toledo Wheelbarrow Works.

TOLEDO, OHIO.



DEAR SIR:—

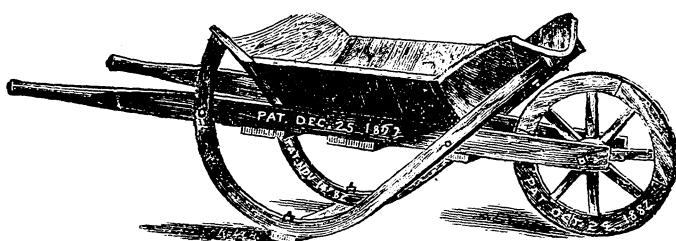
We call the trade's attention to the construction of our new steel wheel.

We use a  $\frac{3}{8}$  round spoke which is cast in hub and passes through tire in wedge shape as shown in sectional cut. In this mode we get twice the strength of the spoke, as in dumping the spoke can't push through or pull out. This sectional view explains the principle fully.

G. W. THOMAS & CO.

## BENT LEG NO. 0.

PATENT JOINTLESS AND BOLTED.

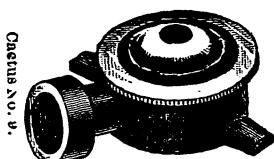


## LAWN SPRINKLERS.

Japanese No. 12,  
Adjust.



We manufacture the BEST and CHEAPEST Lawn Sprinklers in the World.

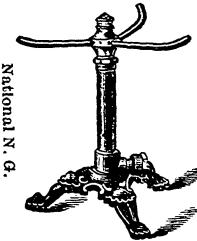


The only Sprinklers which have no revolving parts to leak or wear out. The only Sprinklers free from small holes, and which cannot become clogged with gritty substances. The only Sprinklers which are adjustable and will give a spray as fine as the mist of Niagara, or as heavy as the area of the supply pipe. The best Sprinklers for high pressures, and the only sprinklers which will give satisfaction with low pressures. We also manufacture the old style revolving sprinklers, but for our own use would not have them.



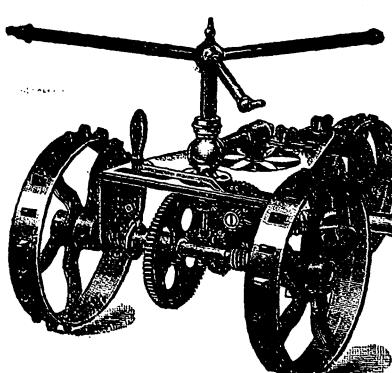
Ette & Henger Mfg. Co.

ST. LOUIS, MO.



SEND FOR DESCRIPTIVE CIRCULARS.

LITTLE GIANT



### Traveling Lawn Sprinkler.

PATENTED.

Can be set to travel anywhere from 15 to 500 feet per hour, either on a straight line or in a circle, and can be gauged to throw water over a swath 5 to 50 feet in width.

Highest Award at World's Columbian Exhibition.

SEND FOR CIRCULAR.

PORTLAND LAWN SPRINKLER CO.,  
PORTLAND, ME.

## LIGHTNING DRAIN CLEANER.

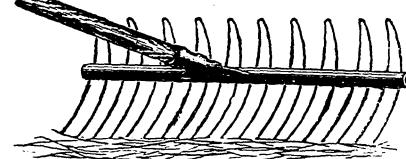
The Drain Cleaner is a hand machine used as a shovel. The dirt pan is made of No. 18 Steel 3 inches deep and 12 inches long, with vertical end in rear. It has a decided advantage over other machines in dipping water and dirt. It is also used in letting down tiles in ditches, which is very convenient and saves extra labor of standing and working in muddy ditches. The iron adjusting rod can be used with great rapidity and ease and can be adjusted to pull or push with as quick a motion as may be desired. To use it in any particular shape tighten the set screw.

For Prices and Discounts, address

BUCKEYE MFG. CO.,



Union City, Ind.



## Lead and Others Follow.

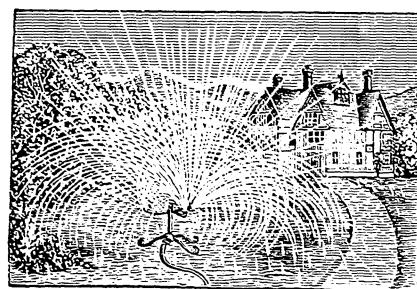
We manufacture the ORIGINALS; others follow! But to lead in prices and quality is the success of our Post-hole Diggers, Reversible Lawn-rakes, Spring Curry-combs, Saw-sets, etc.

F. E. KOHLER & CO.,  
CANTON, OHIO.

GENUINE

## "CALIFORNIA"

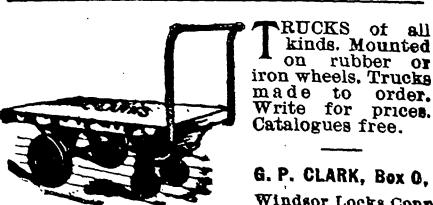
Lawn Sprinkler.



MANUFACTURED BY  
BLAIR MANUFACTURING CO.  
SPRINGFIELD, MASS.

Write for prices.

Also makers of the most complete line of Lawn Mowers on the market.



G. P. CLARK, Box 0,  
Windsor Locks, Conn.

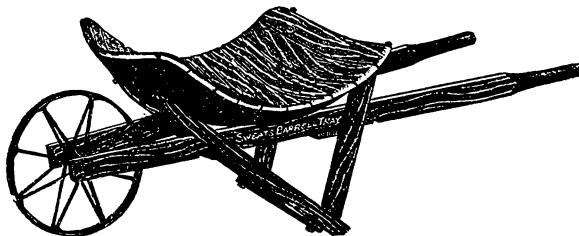
# WE OFFER YOU

## The Newest and Best Wheelbarrow Made.

Its structure is **NOVEL**, **STRONG** and **ENDURING**. Barrel Tray, Bolted frame, Hubbard's Patent Steel Wheels.

Contractors, Builders and all users will appreciate it.

"QUEEN  
B"



Patent Barrel  
Tray.

MANUFACTURED ONLY BY

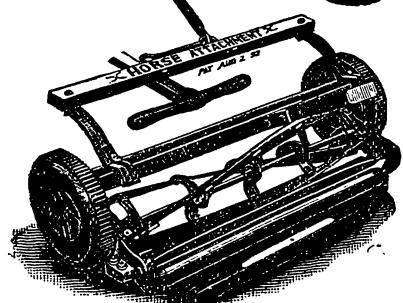
**Sweatt M'f'g Co.,**  
Minneapolis, Minn.

**Withington & Cooley M'f'g Co.,**  
Jackson, Mich.

Affording convenient source of supply for both Western and Eastern buyers. Stocks carried also in

**CHICAGO and NEW YORK.**

# "CHIEF" MOWER



With Horse Attachment.

TEN INCH TRACTION WHEEL. EXCELS FOR FINE QUALITY OF MATERIAL AND FINISH. SIMPLE ADJUSTMENTS, SMOOTH CUTTING.

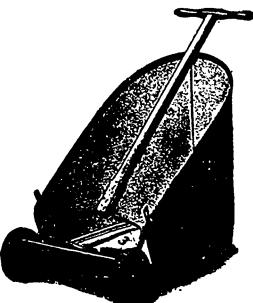
THE ONLY FIRST-CLASS COMBINATION MOWER ON THE MARKET. PRICES LOW, TERMS REASONABLE.

Mfd. by **CHAMPION MFG. CO.,**

LAWN MOWERS, 257 Ft. Wayne Ave.,  
Rakes, Etc. Richmond, Ind.

## THE LAWN MOWER'S PARTNER.

The only practical **Grass Carrier** in the world. It received the Highest and Only Award at the World's Fair. It is adjustable to **all sizes** and **makes of Mowers**.



### FOR SALE BY THE FOLLOWING JOBBERS.

Coldwell Lawn Mower Co., Newburg, N. Y.  
J. S. Woodhouse, New York City.  
Dunham, Carrigan & Hayden Co., San Francisco.  
Cal.  
Shields & Brother, Philadelphia, Pa.

Hamilton & Mathews, Rochester, N. Y.  
Chas. H. Chields & Co., Utica, N. Y.  
Joseph Breck & Sons, Boston, Mass.  
Buckingham, Clark & Jackson, New Haven, Conn.  
Wabridge & Co., Buffalo, N. Y.

Bindley Hardware Co., Pittsburgh, Pa.  
The McIntosh-Huntington Co., Cleveland, O.  
A. F. Shapleigh Hardware Co., St. Louis, Mo.  
W. E. Barrett & Co., Providence, R. I.  
Henry Keldel & Co., Baltimore, Md.

If your Jobber does not handle it write for prices and circulars to

**J. GLENNON & CO.** (Patentees and Sole Manufacturers), 2622 Shields Ave., Chicago.

The Synonym for Perfection in

Lawn Mowers is "PENNSYLVANIA."

Please Read following:—

### HOW DO THEY WEAR?

"A single straw shows which way the wind blows."

"I have used this Pennsylvania Machine nearly 15 years and only paid out 5 cents on it, and to-day does as good work as it ever did."

(Signed),

L. OSBORN,

Jan. 17, 1894.

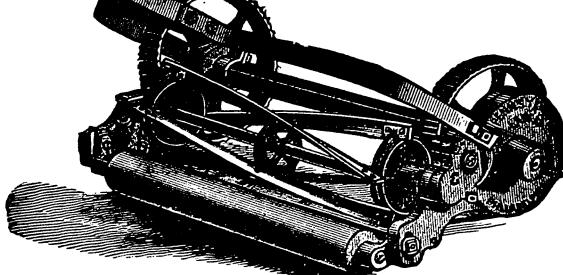
Greenville, Mich.

Highest Award at World's Fair on our entire line of Lawn Mowers.

Largest manufacturers of Lawn Mowers in the known world—Continental, New Quaker City, Great American, New Departure, Horse and Two-man Lawn Mowers.

Supplee Hardware Co., PHILADELPHIA.

Most Popular Mower on the Market.



## McGuire's Diamond.

MANUFACTURED BY

Dille & McGuire Mfg. Co.,

RICHMOND, IND., U. S. A.

### PRICE-LIST.

Wheels, 8 Inches High. Cutter, 5½ Inches Diameter.

LENGTH.	LIST.	Discount to the
10 Inch	\$13.00	Trade,
12 "	14.00	70 per cent.,
14 "	15.00	F.O.B. Factory.
16 "	16.00	
18 "	17.00	

PHOSPHOR BRONZE JOURNAL BEARINGS. BEST QUALITY STEEL.

This is the Mower contracted for by the Chief of Construction at the Columbian Exposition; was used on the lawns at the World's Fair grounds during the preparatory season of 1892, and being approved by the Landscape Architects, was adopted exclusively for 1893.

If you wish a first-class Mower in all respects, one that is fully warranted,

—BUY McGuire's DIAMOND.—

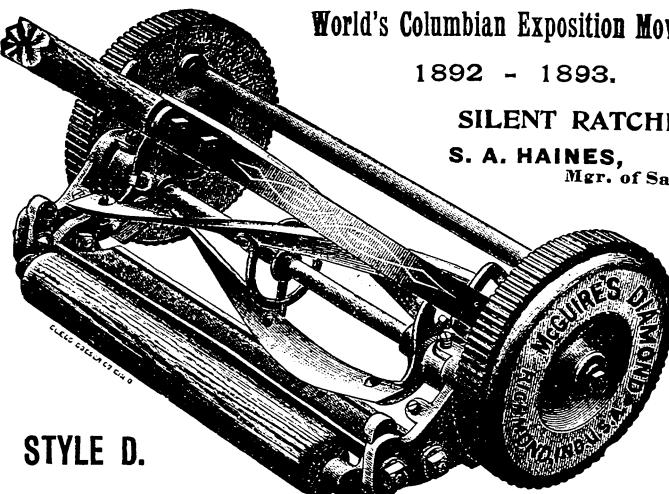
### OFFICIAL

World's Columbian Exposition Mower.

1892 - 1893.

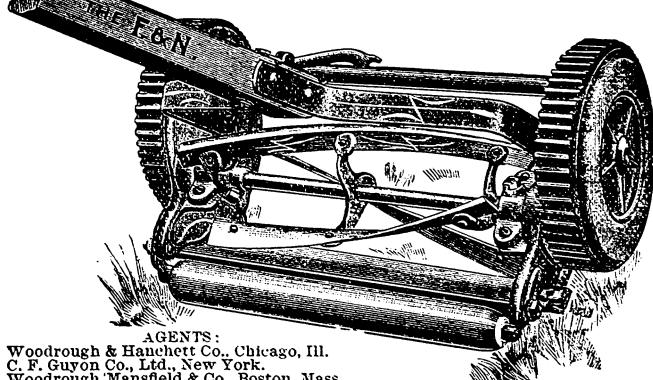
### SILENT RATCHET.

S. A. HAINES,  
Mgr. of Sales.



STYLE D.

## THE F. & N. MFG. CO.,



AGENTS:  
Woodrrough & Hanchett Co., Chicago, Ill.  
C. F. Guyon Co., Ltd., New York.  
Woodrrough, Mansfield & Co., Boston, Mass.

Manufacturers of  
Lawn Mowers  
and  
Grass Catchers,  
RICHMOND, IND., U. S. A.

THE  
F. & N.  
LAWN  
MOWER  
" '94."

Solid Steel Cutter Bar, Reel  
Knives adjusted to Cutter  
Bar. Phosphor Bronze Reel  
Bearings.

## Chadborn & Coldwell

Mfg. Co.,

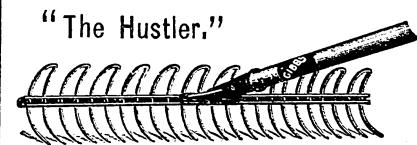
NEWBURGH, N. Y.,  
Sole Manufacturers of



New Model  
AND  
Excelsior  
LAWN  
MOWERS  
ALSO  
The Rival,  
The OK,  
Etc., Etc.

Send for Illustrated Catalogue.

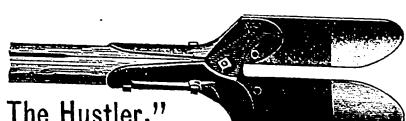
### "The Hustler."



By buying the Hustler LAWN RAKES you have the cheapest and best made. All leading jobbers handle them.

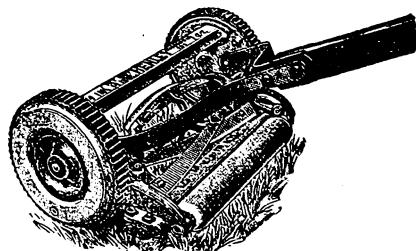
## GIBBS MFG. CO., Canton, Ohio.

Our line of Post Hole Diggers comprises 5 of the Best Known Styles on the market. Prices low.



## HENLEY'S MOWERS

For Lawns and Parks



Are first class, high grade machines, made of the best materials, neat, symmetrical, strong and unexcelled in construction and ease of operation. Does perfect work. For prices, address

M. C. HENLEY, Sole Mfr., Richmond, Ind., U. S. A.

EASTERN REPRESENTATIVES: H. S. Earle, 110 and 112 N. Warren St., Syracuse, N. Y.; Wm. H. Cole & Sons, 13 S. Charles St., Baltimore, Md.; Carpenter & Bayles, 91 Chambers St., New York City.

# BUCKEYE AND GLOBE

LAWN  
MOWERS.

Made in 10, 12, 14, 16 and 18 inch cut.

ALSO MANUFACTURERS OF

THE CHAMPION AND

JEWEL LAWN MOWERS.

All of Which are First-Class in Quality  
Durable and far Surpassing all

BUCKEYE

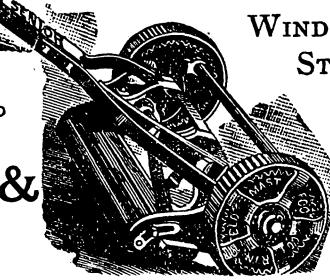
FORCE PUMPS.

IRON TURBINE AND COLUMBIA STEEL

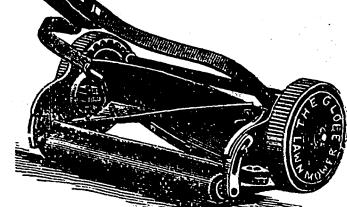
WIND ENGINES AND  
STEEL DERRICKS.

Send for Circulars and Prices to

MAST, FOOS &  
CO.,



Springfield,  
Ohio.



## “BEST HIGH GRASS.”

This is a strictly High Grass Mower, although it will cut short grass equal to a light Mower, and is very light draft, considering the weight.

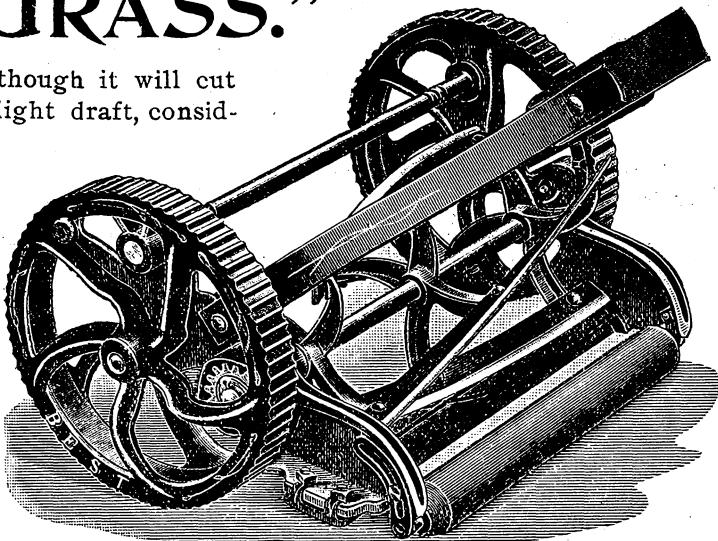
The wheels are  $10\frac{1}{2}$  inches diameter, reel 8 inches diameter, and will cut grass 10 inches high.

The reel boxes are brass, and self-aligning; every part of the Mower is easy of access to oil or adjust.

The connection is on the same principle as all others of our make, except  $\frac{1}{16}$  shaft is used, instead of  $\frac{1}{8}$  shaft. This is a nice looking Mower.

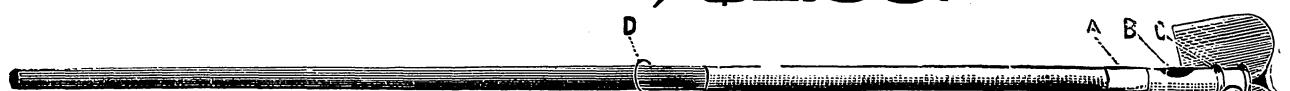
WRITE FOR DISCOUNTS TO

Dille & Anderson, Richmond, Ind.



## AYERS' COMBINED HAND PLANTER AND HOE.

PRICE, \$2.00.



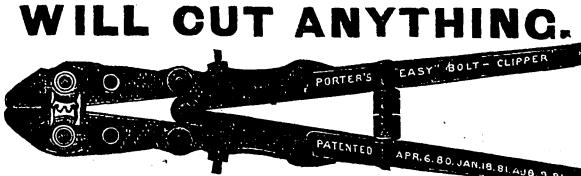
A. Ferrule which slides over and closes the opening B.  
B. The opening where the corn is introduced.  
C. Malleable clamp and shank. D. Push-ring which works the seed slide.  
The right edge of the hoe blade is allowed to strike the ground, which brings the nozzle down, the wire D is pressed and the corn is dropped from the nozzle E, an instant only being required for the operation.

This is a convenience everywhere, besides being the only planter adapted for hard, rough and rocky ground requiring a hoe in covering; and in such cases it enables the workman to accomplish twice the usual service. For replanting and first hoeing it is especially adapted, as it is both a hoe and planter as required. As a hoe it is cheap at 50 cts., which leaves only \$1.50 as the additional cost for the planter, which is nothing in comparison to the convenience of always having a planter in hand supplied with seed during the operation of hoeing. With beans and peas it is even more accurate than with corn. There is hardly a farmer in the country who would not find it an economy to have one of these planters, however many other planters he may have or however good they may be. Agents wanted everywhere. Inducements liberal. Shipments f. o. b New York or Petersburg, Va., as desired. Correspondence solicited.

**J. R. AYERS**, Patentee and Manufacturer, **PETERSBURG, VA.**

VENTILATION.

THE “EASY” BOLT CLIPPER.  
WILL CUT ANYTHING.



Manufactured by  
**H. K. PORTER**,  
66 Beverly St.,  
Boston, Mass.

23,000 Sold.

DAVID WILLIAMS, Publisher & Bookseller,  
96-102 Reade St., New York.

It is the Best in the World  
For sale by the trade generally. SEND FOR CIRCULAR.

# WROUGHT WASHERS

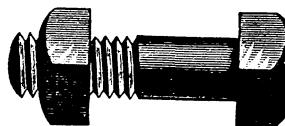
True  
to  
Guage

Made from specially rolled plate by our own patented machinery.  
Every washer flat, with hole in true center. Sold in 200 lb. kegs, or 1 and 5 lb. paper boxes.

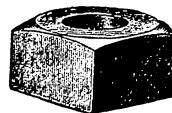
Get prices.

THE MILTON MANUFACTURING CO., MILTON, PA.

# HIGH GRADE

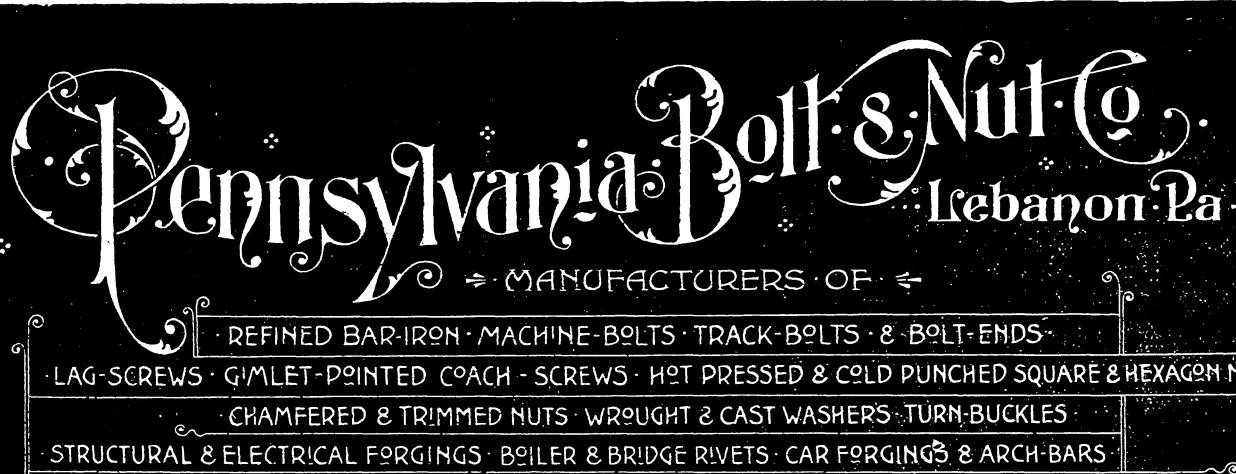


## Machine Bolts



## Hot pressed Nuts

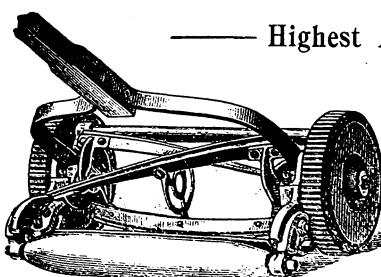
Stamped to size. Guaranteed extra quality.  
Send for catalogue.



## Genuine Philadelphia Lawn Mowers.

Highest Award at the Field trial, World's Fair, Chicago, 1893.

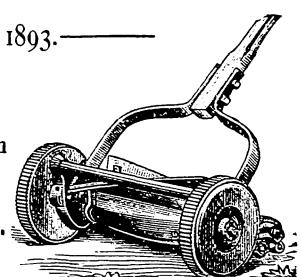
### 375,000 Machines Sold.



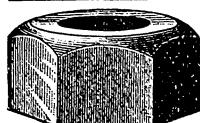
Hand, Pony and Horse Machines, Traveling Lawn Sprinkler, Lawn Sweeper and Collectors.

ACKNOWLEDGED STANDARD OF EXCELLENCE FOR 22 YEARS.

SEND FOR PRICE-LIST AND DISCOUNTS.



THE PHILADELPHIA LAWN MOWER CO., { Successors to Graham, Passmore & Co., } 3107 & 3109 Chestnut St., Philadelphia, Pa.



### PORTCHESTER BOLT & NUT CO.

Port Chester, N. Y.

MANUFACTURERS OF

BOLTS, NUTS, RIVETS and WASHERS  
CHAMFERED AND TRIMMED.

SQUARE AND HEXAGON NUTS A SPECIALTY.

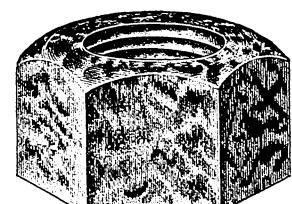


### DUNHAM NUT CO.,

UNIONVILLE, CONN.

Manufacturers of

All Grades  
of  
Finished  
Nuts  
and



Automatic Cold Press Nut Machines.

SEND FOR CATALOGUE.



Manufacturers of Single and Double,  
For fastening all kinds of Structure to Brick and Stone  
Work. Catalogue furnished on application.  
STEWARD & ROMAINE MFG. CO., - - Philadelphia.

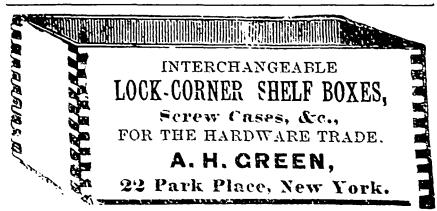
### The New Britain Hardware Mfg. Co.

New Britain, Conn., U. S. A.

MAKERS OF ALL KINDS OF  
Special Machine Screws, Studs, Bolts, &c.  
BICYCLE PARTS,  
SPECIAL HARDWARE.

Pattern Makers' Dowels and Emery Wheel Dressers  
Electro, Brass and Nickel Plating.

INTERCHANGEABLE  
LOCK-CORNER SHELF BOXES,  
Screw Cases, &c.,  
FOR THE HARDWARE TRADE.  
A. H. GREEN,  
22 Park Place, New York.



WM. H. HASKELL, PRESIDENT.

E. S. MASON, TREASURER.

D. A. HUNT, AGENT.

**WM. H. HASKELL CO.,**

—MANUFACTURERS OF—

**GIMLET POINT  
COACH SCREWS**



**Bolts, Cold-Punched  
Nuts and Washers,  
SUITABLE FOR MACHINERY  
OF ALL KINDS.**

Office and Works: 451 Main St., PAWTUCKET, R. I., U. S. A.

**HENRY B. NEWHALL CO., Agents,**

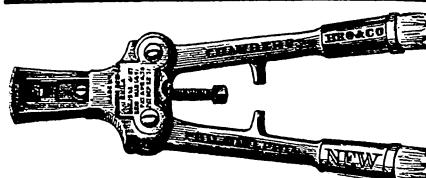
105 CHAMBERS STREET, NEW YORK. 47 PEARL STREET, BOSTON.

**WORCESTER MACHINE SCREW CO., Worcester, Mass.**

MANUFACTURERS OF

**SET,  
CAP AND  
MACHINE  
SCREWS.****STUDS FOR  
STEAM ENGINES.  
PUMPS, &c.****EXPANSION BOLTS.**

For Fastening all Kinds of Structure to  
Brick and Stone Work.  
Patentee and M'fr, ISAAC CHURCH.  
Toledo, O.  
Send for Catalogue.



**BOLT & RIVET CLIPPERS,**  
For cutting off the ends of Bolts and Rivets.  
Liberal discounts to the trade.

**CHAMBERS BROTHERS COMPANY,**  
52d St., BELOW LANCASTER AVE.,  
PHILADELPHIA, PA.

**WM. H. JACOBUS,**

No. 90 Chambers St., New York.

## New York Office of

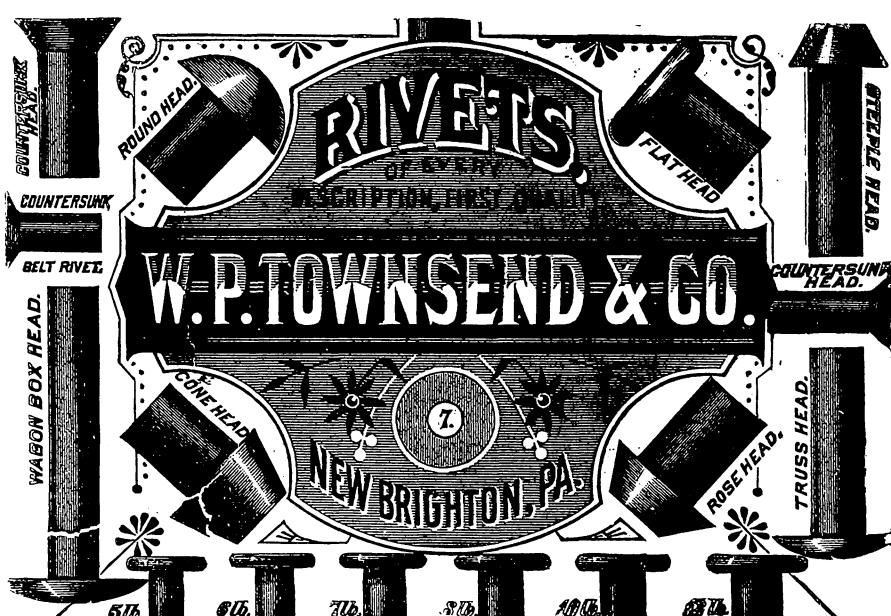
J. F. Wollensak.  
Barnes Mfg. Co.  
N. R. Streeter & Co.  
Geo. W. Nock.  
Tuck Mfg. Co.

Henis Vegetable Press.  
Dille & McGuire Mfg. Co.  
Bommer Bros.  
Palmer Hdw. Mfg. Co.  
Wire Goods Co.

National Rivet Works.  
Wolcott Hdw. Co.  
Fibre Head Mallet.  
Burnside Cedar Faucets.  
Cleveland Window Shade Co.

Zimmerman's Blind Adjusters.  
Garrett & Beach.  
Wilcox Mfg. Co.  
M. B. Schenck & Co.  
Hemacite Mfg. Co.

Franklin Mfg. Co.  
Atlas Mfg. Co.  
National Specialty Mfg. Co., Ltd.



ESTABLISHED 1865.

**J. H. Sternbergh & Son,**

READING  
PA.

MANUFACTURERS OF  
**BOLTS, NUTS, WASHERS, RIVETS,**  
Including Machine Bolts, Carriage Bolts, Bridge Bolts and Car Bolts,  
**THE HARVEY PATENT GRIP-THREAD TRACK BOLT,** Soft Steel Bolts with Cold Rolled  
Thread, Bolt Ends, Turnbuckles, Sleeve Nuts, Lag Screws, Set Screws and Tap Bolts and every variety of  
screwed work,  
**BOILER, BRIDGE AND SHIP RIVETS,** Square and Hexagon Nuts of all kinds and sizes, Plate  
Washers, Bolt Lacing Machines, Rods and Irons for Bridges and Buildings, Merchant Bar Iron, etc., etc.  
Branch Establishment, **THE KANSAS CITY BOLT & NUT CO.** Kansas City, Mo.



**J. FRED WILSON, Worcester, Mass.**  
**Metal Punching & Die Work.**  
Cold Punched Nuts and Washers  
for all Purposes.  
SEND FOR PRICES ON  
**SPECIALTIES IN LINE OF PRESS WORK.**

# CLASSIFIED LIST OF ADVERTISERS.

## Agricultural Implements.

Ayers, J. E., Petersburg, Va.  
Sickles, Sweet & Lyon, 35 Barclay St., N. Y.

## Air Compressors.

Norwalk Iron Works, S. Norwalk.  
Rand Drill Co., 28 Park Place, N. Y.

## Air Moving Machinery.

Howard & Morse, 45 Fulton, N. Y.

## Alumium.

Illinoi Pure Aluminum Co., Lemont, Ill.  
Pittsburgh Reduction Co., Pittsburgh.

Scovill Mfg. Co., Waterbury, Conn.

## Aluminum, Brass and Bronze.

Gaylor, F. L. Co., Ansonia, Conn.  
Haight & Clark, Albany, N. Y.  
Pratt & Cady Co., Hartford, Conn.  
St. Louis Bronze & Aluminum Works, St. Louis, Mo.

## Aluminum Solder.

Alsite Aluminum Co., 106 Liberty St., N. Y.

## Analytical Chemists.

Britton, J. Blodgett, Philadelphia, Pa.  
Moore, Dr. Gideon E., 221 Pearl St., N. Y.

## Anti-Friction Metals.—See Babbitt Metal.

## Anvil and Vise (Combination).

Fulton Iron & Engine Works, Detroit, Mich.

## Apple Parers.

Goodell Co., Antrim, N. H.

## Arms and Ammunition.

Harrington & Richardson Arms Co., Worcester, Mass.

Hartley & Graham, 313 & 315 Broadway, New York.

Ideal Mfg. Co., New Haven, Conn.

Stevens, J. Arms and Tool Co., Chico-pee Falls, Mass.

Union Metallic Cartridge Co., 313 & 315 Broadway, N. Y.

## Auctioneers.

Bissell, E. Son & Co., N. Y.

## Axes.

Peck, A. G. & Co., Cohoes, N. Y.

## Axes, Springs, &c., Manufacturers of.

Gautier Steel Dept. of Cambria Iron Co., Johnstown, Pa.

Wurster, F. W. & Co., Brooklyn, N. Y.

## Babbitt Metal.

Crown Smelting Co., Chester, Pa.

Hertz, T. & Son, St. Louis, Mo.

Keys, W. W. & R. M. Co., Bridgeport, Conn.

Reeves, Paul S., Philadelphia, Pa.

## Bakers and Roasters.

Bronson Supply Co., Cleveland, Ohio.

## Bale Ties.

Kilmer Mfg. Co., Newburg, N. Y.

## Barb Wire and Fence.

Gautier Steel Dept. of Cambria Iron Co., Johnstown, Pa.

Indiana Wire Fence Co., Crawfordsville, Ind.

Kilmer Mfg. Co., Newburg, N. Y.

Ludlow-Saylor Wire Co., St. Louis, Mo.

Washburn & Moen Mfg. Co., Worcester, Mass.

## Bar Iron, Manufacturers of.

Aetna-Standard Iron & Steel Co., Bridgeport, Ohio.

Allentown Rolling Mill, Allentown, Pa.

Burden Iron Co., Troy, N. Y.

Crescent Horse Shoe & Iron Co., Max Meadows, Va.

Montour Iron & Steel Co., Danville, Pa.

Mahoning Valley Iron Co., Youngstown, Ohio.

Sternbergh, J. H. & Son, Reading, Pa.

## Barrel Openers.

Specialty Mfg. Co., Hartford, Conn.

## Bellows, Manufacturers of.

Scott, Geo. M., Chicago, Ill.

## Bells.

Bevin Bros. Mfg. Co., East Hampton.

## Belt Dressing.

Jos. Dixon Crucible Co., Jersey City, N. J.

## Belt Fasteners.

Bristol Co., Waterbury, Conn.

Claffen Mfg. Co., Cleveland, Ohio.

Talcott, W. O., Providence, R. I.

## Beltting, Makers of.

Alexander Bros., 412 N. 3d, Phila.

Jeffrey Mfg. Co., Columbus, O.

Link-Belt Engineering Co., Phila., Pa.

Main Beltting Co., Philadelphia, Pa.

N. Y. Belting & Packing Co., Ltd., N. Y.

Roberts Mfg. Co., Pittsburg, Pa.

Shultz Beltting Co., St. Louis, Mo.

Stanley Works, New Britain, Conn.

## Bending Rolls.

Wickes Bros., Saginaw, Mich.

## Bicycle Locks.

Dieffenbacher, W. H. & Co., Chicago, Ill.

## Bicycle Parts.

New Britain Hdw. Mfg. Co., New Brit-

ain, Conn.

## Bicycles and Bicycle Sundries.

Bevin Bros. Mfg. Co., E. Hampton,

Mass.

Bridgeport Gun Implement Co., 313

315 Broadway, New York.

Cronson Supply Co., Cleveland, O.

Crawford Mfg. Co., Hagerstown, Md.

Diegenbacher, W. H. & Co., Chicago, Ill.

Eagle Bicycle Mfg. Co., Torrington, Ct.

Grand Rapids Cycle Co., Grand Rapids, Mich.

Haines & Zimmerman, 407 Cherry Street, Philadelphia.

Heath, S. F. Cycle Co., Minneapolis, Minn.

Indiana Bicycle Co., Indianapolis, Ind.

League Cycle Co., Hartford, Conn.

Lovell, Jno. P. Arms Co., Boston, Mass.

Monarch Cycle Co., Chicago, Ill.

Pierce, Geo. N. & Co., Buffalo, N. Y.

Pope Mfg. Co., Boston, Mass.

Read, Wm. & Sons, Boston, Mass.

Remington Arms Co., 313-315 Broadway, New York.

Stearns, E. C. & Co., Syracuse, N. Y.

Sterling Cycle Works Chicago, Ill.

Stokes Mfg. Co., Chicago, Ill.

Toledo Metal Wheel Co., Toledo, O.

Boyle Pumps.

Heath, S. F. Cycle Co., Minneapolis, Minn.

Blocks, Tackle, Makers of.

Cleveland Block Co., Cleveland, O.

Fulton Iron & Engine Works, Detroit, Mich.

Union Hardware Co., Torrington, Ct

Blowers.

Buffalo Forge Co., Buffalo, N. Y.

Champion Blower & Forge Co., Lancaster, Pa.

Huvett & Smith Mfg. Co., Detroit, Mich.

Sturtevant, B. F. & Co., Boston, Mass.

Boiler Plates.

Carbon Steel Co., Pittsburgh, Pa.

McIlvain, Wm. & Sons, Reading, Pa.

Lukens Iron & Steel Co., Coatesville, Pa.

Pottstown Iron Co., Pottstown, Pa.

Boilers, Copper.

Randolph & Cloves, Waterbury, Conn.

Boilers, Steam.

Babcock & Wilcox Co., 30 Cortlandt, Chandler & Taylor Co., Indianapolis, Ind.

Fulton Steam Boiler Works and Fdry., Richmond, Ind.

Harrison Safety Boiler Wks., Phila., Pa.

Pollock, W. B. & Co., Youngstown, O.

Southwark Fdy. & Mch. Co., Phila., Pa.

Wetherill, Robt. & Co., Chester, Pa.

Bolt Cutters.

Chambers Bros. Co., Philadelphia.

Howard Iron Works, Buffalo, N. Y.

Porter, H. K., Boston, Mass.

Reece, Edw. F., Greenfield, Mass.

Wells Bros. & Co., Greenfield, Mass.

Wiley & Russell Mfg. Co., Greenfield, Mass.

Books.

Williams, David, 96-102 Reade, N. Y.

Wolcott & West, Syracuse, N. Y.

Boring Machines.

Buckeye Mfg. Co., Union City, Ind.

Box Straps and Corners.

Cary Mfg. Co., 5 to 9 Elm St., N. Y.

Boxes, Hdw. Shelf, &c.

Green, A. H., 22 Park Place, N. Y.

Jones, Jess & Co., Philadelphia, Pa.

Brass, Manufacturers of.

Ansonia Brass & Copper Co., N. Y.

Davil, John & Sons, 100 John, N. Y.

Plume & Atwood Mfg. Co., N. Y.

Randolph & Cloves, Waterbury, Conn.

Rome Brass & Copper Co., Rome, N. Y.

Scovill Mfg. Co., Waterbury, Conn.

Waterbury Brass Co., 296 B'way, N. Y.

Brass Butt Hinges.

Tiebout, W. & J., 16 & 18 Chambers.

Brass Founders.

Best, Fox & Co., Pittsburgh, Pa.

Cramp, Wm. & Sons S. & E. B. Co., Philadelphia, Pa.

Eynons-Evans Mfg. Co., Philadelphia, Pa.

Fraim, E. T., Lancaster, Pa.

Haight & Clark, Albany, N. Y.

Keys, W. & R. M. Co., Bridgeport, Conn.

North Bros. Mfg. Co., Phila., Pa.

Reeves, Paul S., Philadelphia.

Brass Goods.

Brass Goods Mfg. Co., 88 Chambers.

Bread and Cake Knives.

Clauss Shear Co., Fremont, O.

Bronze (Tobin).

Ansonia Bronze & Copper Co., 10-21 Cliff Street, N. Y.

Brooms and Brushes.

Bromwell Brush & Wire Goods Co., Cincinnati, Ohio.

Cincinnati Mfg. Co., Cincinnati, O.

Lay, Jos. & Co., Ridgeville, Ind.

Builders' Hardware.

Corbin, P. & F., New Britain, Conn.

Deitz, A. E., 97 Chambers St., N. Y.

Reading Hdw. Co., Reading, Pa.

Yale & Towne Mfg. Co., Stamford, Ct.

Butchers' Steels.

Chatillon, John & Sons, 85-89 Cliff St., N. Y.

Hoffman, C. & A., Philadelphia, Pa.

Butcher and Shoe Knives, Manufacturers of.

Chatillon, John & Sons, 85-89 Cliff St., N. Y.

Goodell Co., Antrim, N. H.

Wilson, John, Sheffield, England.

Butts and Hinges.

Chicago Wrought Butt & Hinge Co., Chicago, Ill.

Class Mfg. Co., Buffalo, N. Y.

McKinnon Mfg. Co., Allegheny, Pa.

Sabin Machine Co., Montpelier, Vt.

Stanley Works, New Britain, Conn.

Tiebout, W. & J., 16 Chambers, N. Y.

## Calipers and Dividers.

J. Stevens Arms and Tool Co., Chico-pee Falls, Mass.

Starrett, L. S., Athol, Mass.

## Car Axles.

Roberts, A. & P. & Co., Phila.

## Carboy Stands.

Wolf, W. & L., Philadelphia, Pa.

## Carriage Hardware, Makers of

Covert's Saddlery Works, Farmer, N. Y.

Eccles, Richard, Auburn, N. Y.

Scranton Forging Co., Scranton, Pa.

Smith, H. D. & Co., Plantsville, Conn.

Wilcox & Howe Co., Birmingham, Conn.

## Cartridge Reloading Tools.

Ideal Mfg. Co., New Haven, Conn.

## Carvers' Tools.

White, Van Glahn & Co., 15-17 Chat-

ham Square, N. Y.

## Casters, Wheel, &c.

Clark, G. P., Windsor Locks, Conn.

## Castings, Iron and Steel.

Booth, The Lloyd Co., Youngstown, O.

The Burr & Houston Co., Brooklyn, N. Y.

Cheney, S. & Son, Manlius, N. Y.

Chester Steel Casting Co., Phila.

Chrome Steel Works, Brooklyn, N. Y.

Eureka Cast Steel Co., Chester, Pa.

Flagg, Stanley G. & Co., Phila.

Gartland Foundry Co., Cleveland, O.

Haight & Clark, Albany, N. Y.

King & Andrews Co., Chicago, Ill.

Palmer & De Mooy, Cleveland, O.

Pratt & Cady Co., Hartford, Conn.

Sessions Foundry Co., Bristol, Conn.

Spencer's I. S. Sons, Guilford, Conn.

Standard Fdy. & Mfg. Co., Cleveland, O.

Western Fdy. Co., Chicago, Ill.

Wetherill, Robert & Co., Chester, Pa.

## Castings, Malleable.

Arcade Malleable Iron Co., Worcester, Mass.

Dayton Malleable Iron Co., Dayton, O.

**Egg Beaters.** North Bros. Mfg. Co., Philadelphia.

**Electric Bells and Supplies.** Ostrander, W. R. & Co., 204 Fulton St., New York.

**Wollensak, J. F., Chicago, Ill.**

**Electric Dynamo Machines.** Hanson & Van Winkle Co., Newark, N. J.

**Elevators, Makers of.** Link-Belt Engineering Co., Phila., Pa.

**Worse Williams & Co., Phila.**

**Warner Elevator Mfg. Co., Cincinnati, O.**

**Emery and Emery Wheels.** N. Y. Belting & Packing Co., Ltd., N. Northampton Emery Wheel, Leeds, Mass.

Norton Emery Wheel Co., Worcester, Mass.

Sterling Emery Wheel Co., 174 Fulton St., New York.

Sturtevant Mill Co., Boston, Mass.

**Emery Wheel Dressers.** Bay State Stamping Co., Worcester, Mass.

**Enamels.** Nubian Iron Enamel Co., Cragin, Ill.

**Engineers and Contractors.** Aiken Henry, Pittsburgh, Pa.

Artificial Gas Engineering Co., Pittsburgh, Pa.

Herrick, J. A., 284 Pearl St., N. Y.

Kennedy, Julian, Pittsburgh, Pa.

Laughlin, Alex. & Co., Pittsburgh, Pa.

Lean, D. R. Co., Pittsburgh, Pa.

McClure & Amaler, Pittsburgh, Pa.

Pittsburgh Iron & Steel Engineers Co., Pittsburgh, Pa.

Smythe, S. R. Co., Incorporated Pittsburgh, Pa.

Swindell, W. & Bros., Pittsburgh, Pa.

**Engines, Gas.** Otto Gas Engine Works, Phila., Pa.

Rollason Gas Engine, Havemeyer Bldg. N. Y.

**Engines, Steam, Makers of.** Bass Foundry & Machine Works, Ft. Wayne, Ind.

Chandler & Taylor Co., Indianapolis, Ind.

Erie Engine Works, Erie, Pa.

Lane & Boddy Co., Cincinnati, O.

Norwalk Iron Works Co., So. Norwalk, Conn.

Penna. Diamond Drill & Mfg. Co., Birdsboro, Pa.

Phila. Engineering Works, Phila., Pa.

Southwark Foundry and Machine Co., Phila., Pa.

Ted, William & Co., Youngstown, O.

Trotter & Hogg Iron & Steel Fdry Co., Pittsburgh, Pa.

Wetherill, Robt. & Co., Chester, Pa.

**Exhaust Tumblers.** sweater, W. A., Brockton, Mass.

**Expansion Bolts.** Boone, W. C. Mfg. Co., Boonton, N. J.

Church, Isaac, Toledo, O.

Steward & Romaine Mfg. Co., Phila., Pa.

**Faucets, Self-Measuring.** Lane Bros., Poughkeepsie, N. Y.

**Faucets, Wooden, Makers of.** John Sommer's Son, Newark, N. J.

**Feed-Water Heaters.** Davis, I. B. & Son, Hartford, Conn.

Goubert Mfg. Co., 32 Cortlandt St., N. Y.

Harrison Safety Boiler Wks., Phila., Pa.

National Pipe Bending Co., New Haven, Conn.

Taunton Locomotive Mfg. Co., Taunton, Mass.

Webster, Warren & Co., Camden, N. J.

Whitlock Coil Pipe Co., Elmwood, Conn.

**Fencing, Iron and Wire.** Barnum, E. T., Detroit, Mich.

Champion Iron Co., Kenton, O.

Cleveland Fence Co., Indianapolis, Ind.

Clinton Wire Cloth Co., Clinton, Mass.

Gilbert & Bennett Mfg. Co., 42 Cliff St., Kilmer Mfg. Co., Newburgh, N. Y.

McCallip Fence & Wire Works, Columbus, O.

Mast, Koos & Co., Springfield, O.

The Van Dorn Iron Works Co., Cleveland, O.

**File Cards.** Frasse Co., 19 Warren St., N. Y.

**Files, Importers of.** Moss, F. W., 80 John St., N. Y.

**Files and Rasps, Manufacturers of.** Arcade File Works, Anderson, Ind.

Banker & White, Troy, N. Y.

Barnett, G. & H., 41 & 43 Richmond Phila.

McCaffrey File Co., Philadelphia.

Nichols File Co., Providence, R. I.

**Fire Brick, Makers of.** Borgner, Cyrus, Philadelphia, Pa.

Gardner, Jas. & Son, Cumberland, Md.

Krebscher, B. & Son, 101 E. Houston, St.

McLeod & Henry Co., Troy, N. Y.

Maurer, H. & Son, 420 E. 23d, N. Y.

Ostrander Fire Brick Co., Troy, N. Y.

Solomon, Jno., 1 M., Wilmington, Del.

Valentine, M. D. & Bro., Woodbridge

**Fishing Tackle.** Dame, Stoddard & Kendall, Boston, Mass.

**Flint and Emery Paper.** Baeder, Adamson & Co., Phila., Pa.

**Flour Sifters.** Meyers, F. J. Mfg. Co., Hamilton, O.

**Fly Traps.** Bromwell Brush & Wire Goods Co., Cincinnati, Ohio.

**Fine Clenners.** Mackey, Jas. T., St. Louis, Mo.

**Fodder Cutters.** Silver Mfg. Co., Salem, O.

**Forges, Portable, &c.** Buffalo Forge Co., Buffalo, N. Y.

Champion Blower & Forge Co., Lancaster, Pa.

Sturtevant, B. F. Co., Boston, Mass.

**Forgings, Iron and Steel.** Bethlehem Iron Co., S. Bethlehem, Pa.

Cambric Steel-Cambric Iron Co., Johnstown, Pa.

Frankford Steel Co., Phila. Pa.

Scranton Forging Co., Scranton, Pa.

U. S. Projectile Co., Brooklyn, N. Y.

**Foundry Facings.** Dixon, Jos., Crucible Co., Jersey City, N. J.

S. Obermeyer Co., Cincinnati, O.

Smith, J. D. Fdy. Supply Co., Cinn., O.

Solomon, Jno. M., Wilmington, Del.

**Foundry Riddles.** Estey, W. S., 65 Fulton, N. Y.

**Foundry Supplies.** Diamond Clamp & Flask Co., Richmond, Ind.

S. Obermeyer Co., Cincinnati, O.

Smith, J. D. Fdy. Supply Co., Cinn., O.

**Friction Clutches.** Keystone Clutch & Mch. Wks., Phila., Pa.

Moore & White Co., Philadelphia, Pa.

**Friction Cone.** Evans Friction Cone Co., Boston, Mass

**Galvanizing Kettles.** Sands, Thos., Nashua, N. H.

**Gas Governors.** N. Y. Gas Saving Co., Decker Building, Union Square, N. Y.

**Gas Producers.** Wood, R. D. & Co., Philadelphia, Pa.

**Gas & Steam Fitters' Supplies.** Pancoast, Henry B. & Co., Phila., Pa.

**Gauge, Rolling Mill.** Haines Gauge Co., Philadelphia, Pa.

**Gear Cutters.** E. Whiton Mach. Co., New London, Conn.

**Gears.** Boston Gear Works Boston, Mass.

Gleason Tool Co., Rochester, N. Y.

Foot, Robt. & Son Co., Baltimore, Md.

U. S. Projectile Co., Brooklyn, N. Y.

**Glass Cutters.** Monce, S. G., Bristol, Conn.

**Glue.** Baeder, Adamson & Co., Phila., Pa.

Dodd, A. W. & Co., Gloucester, Mass.

Russe Cement Co., Gloucester, Mass.

**Grass Carriers.** Giannon, J. & Co., Chicago, Ill.

**Grass Catchers.** Supplee Hardware Co., Phila., Pa.

**Grinding and Polishing Machines.** Blake & Johnson, Waterbury, Conn.

**Grindstones.** Cleveland Stone Co., Cleveland, O.

**Gun Implements.** Union Hdw. Co., Torrington, Conn.

**Gunpowder, Makers of.** Lafin & Rand Powder Co., 29 Murray St., N. Y.

**Handles.** New York Mallet and Handle Wks., 458 E. Houston St., N. Y.

Piqua Handle & Mfg. Co., Piqua, Ohio.

**Hangers, Door.** Coburn, Trolley Track Mfg. Co., Holyoke, Mass.

Lane Bros., Poughkeepsie, N. Y.

Victor Mfg. Co., Newburyport, Mass.

**Hardware Comm'r Merchants.** Graham, John H. & Co., 111 Chambers St., New York.

Jacobus, W. H., 90 Chambers, N. Y.

**Hardware Manufacturers.** Stearns, E. C. & Co., Syracuse, N. Y.

Union Mfg. Co., 103 Chambers, N. Y.

Yale & Towne Mfg. Co., Stamford, Conn.

**Hardware Mfrs.' Agents.** Blinham, W. Co., Cleveland, O.

Clarke, Thomas, St. John, N. B.

Graham, John H. & Co., 111 Chambers St., New York.

Sickles, Sweet & Lyon, 35 Barclay, N. Y.

**Hardware Specialties.** Acme Shear Co., Bridgeport, Conn.

Berger Bros., Philadelphia, Pa.

Clark Mfg. Co., Buffalo, N. Y.

Enterprise Mfg. Co., Philadelphia, Pa.

Ette & Henger Mfg. Co., St. Louis, Mo.

Gwinnett Mfg. Co., Hamilton, O.

Haines & Zimmerman, Phila., Pa.

Johnson, S. C., Racine, Wis.

Knapp & Cowles Mfg. Co., Bridgeport, Conn.

New Britain Hdw. Mfg. Co., New Britain, Conn.

North Bros. Mfg. Co., Philadelphia, Pa.

Peabody & Parks, Troy, N. Y.

Scranton & Co., New Haven, Conn.

Shepard, Sidney & Co., Buffalo, N. Y.

Wilson, J. Fred, Worcester, Mass.

**Harness Snaps.** Covert Mfg. Co., West Troy, N. Y.

Covert's Saddlery Wks., Farmer, N. Y.

Fitch, W. & E. T., New Haven, Conn.

**Hoisting Machines.** Box, Alfred & Co., 314 Green, Phila.

Brown Hoisting & Conveying Mch. Co., Cleveland, Ohio.

Fulton Iron & Engine Wks., Detroit, Mich.

**Hollow Ware.** Avery Stamping Co., Cleveland, O.

Bronson Supply Co., Cleveland, Ohio.

Cleveland Stamping & Tool Co., Cleveland, O.

**Hollow Ware, Aluminum.** Illinois Pure Aluminum Co., Lemont, Ill.

**Horse Nails, Makers of.** Capewell Horse Nail Co., Hartford, Conn.

National Horse Nail Co., Vergennes, Vt.

Putnam Nail Co., Neponset, Boston, Mass.

**Horse and Mule Shoes, Makers of.** Bryden Horse Shoe Co., Catasauqua, Pa.

Burden Iron Co., Troy, N. Y.

Crescent Horse Shoe & Iron Co., Max Meadows, Va.

Diamond State Iron Co., Wilmington, Del.

Old Dominion Iron & Nail Works Co., Richmond, Va.

Phoenix Horse Shoe Co., Poughkeepsie, N. Y.

Rhode Island Perkins Horse Shoe Co., Providence.

Shoenberger & Co., Pittsburgh, Pa.

Standard Horse Shoe Co., Boston, Mass.

**Hose Menders.** Hudson, C. E. & Co., Leominster, Mass.

Jones, M. D. & Co., Boston, Mass.

**Hose.** N. Y. Belting & Packing Co., Ltd., 15 Park Row, N. Y.

**Hydrants, &c.** McLean, John, 296 & 298 Monroe, N. Y.

**Hydraulic Forging.** U. S. Projectile Co., Brooklyn, N. Y.

**Hydraulic Jacks.** Dudgeon, Richard, 24 Columbia, N. Y.

McCoy, Jos. F. Co., 26 Warren St., N. Y.

**Ice Breakers.** Clement & Dunbar, Philadelphia, Pa.

Wharton, Jos. S., Lovering, Phila., Pa.

**Ice Cream Freezers.** Clement & Dunbar, Phila., Pa.

North Bros. Mfg. Co., Phila., Pa.

Packer, C. W., Philadelphia, Pa.

Tatum, S. C. & Co., Cincinnati, Ohio.

White Mountain Freezer Co., Nasua, N. H.

**Ice Shavers.** Enterprise Mfg. Co., Phila., Pa.

**Injectors.** Eynon-Evans Mfg. Co., Philadelphia, Pa.

Jenkins Bros., New York.

Sherwood Mfg. Co., Buffalo, N. Y.

**Insurance, Boiler.** Hartford Steam Boiler Inspection & Insurance Co., Hartford, Conn.

**Iron and Steel, Swedish.** Lundberg, Gustav, Boston, Mass.

Milne, A. & Co., 1 Broadway, N. Y.

**Iron Commission Brokers.** Corning, Edw. & Co., 29 Broadway, N. Y.

Cotton, Barclay W. & Co., Phila.

Etting, Edw. J., Philadelphia.

Hogan, John L. & Co., Philadelphia, Pa.

Hoffman, J. W. & Co., Philadelphia.

Levis, Henry C. & Co., Philadelphia.

Reedley, Jerome & Co., Philadelphia.

Lea, J. Tattnall & Co., Philadelphia.

Monk, J. J., 430 Walnut, Philadelphia.

Pilling & Crane, Philadelphia, Pa.

Wister, L. R. & Co., Phila., Pa.

**Iron Ore.** Samuel, Frank, Philadelphia, Pa.

**Iron, Merchants.** Barnes, C. K. & Co., Philadelphia, Pa.

Borden & Lovell, 70 West, N. Y.

Bussentius & Cuniff, Philadelphia.

Corning Edw. & Co., 29 Broadway, N. Y.

Cox, Justice, Jr., Philadelphia.

Cotton, Barclay W. & Co., Phila.

Hoffman, J. W. & Co., Philadelphia.

Leonard, J., 446 West St., N. Y.

Nicols, Wheeler & Co., Philadelphia.

Ogden & Wallace, 85 Elm St., N. Y.

Pierson & Co., 29 Broadway, N. Y.

Thomson, W. H. & Co., Phila., Pa.

Wallace, Wm. H. & Co., Albany & Washington Streets, N. Y.

Whitney, A. R. & Co., 17 Broadway, N. Y.

Wilson, E. H. & Co., Philadelphia.

**Iron, Importers.** Abbott Wheelock & Co., N. Y. and Boston.

Lundberg, Gustav, Boston, Mass.

**Iron, Sheet, Manufacturers of.** Cambridge Iron & Steel Co., Cambridge, Ohio.

W. Dewees Wood Co., Lim., McKeesport, Pa.

**Iron Vases.** Walbridge & Co., Buffalo, N. Y.

**Ironwork, Ornamental.** Barnum, M. T., Detroit, Mich.

Champion Iron Co., Kenton, O.

Lindlow-Saylor Wire Co., St. Louis, Mo.

Mast, Foss & Co., Springfield, O.

The Van Dorn Iron Works Co., Cleveland, O.

**Keys.** Wollensak, J. F., Chicago, Ill.

**Ladders, Rolling.** Coburn, Trolley Track Mfg. Co., Holyoke, Mass.

**Ladies.** Detroit Fdy. Equipment Co., Detroit, Mich.

**Lamp Stoves.** Glazier Stove Co., Chelsea, Mich.

**Lanterns.** Steam Gauge & Lantern Co., Syracuse, N. Y.

**Lathes.** Draper Machine Tool Co., Worcester, Mass.

Johnson, Israel H., Jr., & Co., Philadelphia, Pa.

Seneca Falls Mfg. Co., Seneca Falls N. Y.

**Lathing, Wire.** Clinton Wire Cloth Co., Clinton, Mass.

N. J. Wire Cloth Co., Trenton, N. J.

Wright & Colton Wire Cloth Co., Worcester, Mass.

**Laundry Machines.** Johnson, S. C., Racine, Wis.

**Lawn Mowers.** Blair Mfg. Co., Springfield, Mass.

Chadborn & Coldwell Mfg. Co., Newburg, N. Y.

Champion Mfg. Co., Richmond, Ind.

Cutwell Lawn Mower Co., Newburg, N. Y.

Dille & Anderson, Richmond, Ind.

Dille & McGuire Mfg. Co., Richmond, Ind.

F. N. Mfg. Co., Richmond, Ind.

Henley, M. C., Richmond, Ind.

Mast, Foss & Co., Springfield, O.

Philadelphia Lawn Mower Co., Philadelphia, Pa.

Supplies Hdwy. Co., Phila., Pa.

**Lawn Rakes.** Gibbs Mfg. Co., Canton, Ohio.

Kohler, F. E. & Co., Canton, O.

**Lawn Sprinklers.** Blair Mfg. Co., Springfield, Mass.

Ette & Henger Mfg. Co., St. Louis.

Gibbs Mfg. Co., Canton, Ohio.

McGowan, John H. Co., Cincinnati, O.

Portland Lawn Sprinkler Co., Portland, Me.

**Lemon Squeezers.** Ripley Mfg. Co., Unionville, Conn.

**Letters and Figures, Metallic.** White, A. A. & Co., Providence, R. I.

**Letters, Paper.** Tablet & Ticket Co., Chicago, Ill.

**Levels.** Richardson, C. F., & Son Atho, Mass.

**Locks and Knobs, Manufacturers of.** Deitz, A. E., 97 Chambers, N. Y.

Reading Hdwy. Co., Reading, Pa.

Smith & Egge Mfg. Co., Bridgeport, Conn.

Yale & Towne Mfg. Co., Stamford, Conn.

**Lubricants.** Dixon, Jos., Crucible Co., Jersey City, N. J.

**Machinery.** Am. Tool Works, Cleveland, Ohio.

Barnes, W. F. & John, Rockford, Ill.

Bement, Miles & Co., Philadelphia, Pa.

Bigelow, C. E., 45 Dey, N. Y.

Bignal & Keeler Mfg. Co., St. Louis.

Bliss, E. W. Co., Brooklyn, N. Y.

Bridgeport Mch. Tool Works, Bridgeport, Conn.

Briggs, Marvin, 12 Broadway, N. Y.

Carlins' Sons, Thos., Allegheny, Pa.

Clapp, Geo. M., art., 74 Cortlandt, N. Y.

Davis, W. P., Rochester, N. Y.

Detrice & Harvey Mch. Co., Baltimore, Md.

Dietz, Schumacher & Co., Cincinnati, Ohio.

Fitchburg Mch. Works, Fitchburg, Mass.

Gavin Mch. Co., Laight & Canal Sts., Gould & Eberhardt, Newark, N. J.

Hamilton Mch. Tool Co., Hamilton, O.

Harrington, E. Son & Co., Phila., Pa.

Henderer, A. L., Wilmington, Del.

Hendev Machine Co., Torrington, Ct.

Hill, Clarke & Co., Boston, Mass.

Howard & Morse, 45 Fulton St., N. Y.

Hulbut-Rogers Mch. Co., South Sudbury, Mass.

Johnson, Israel H., Jr., & Co., Phila.

Jones & Lanson Mch. Co., Springfield, Vt.

Lovagegrove & Co., Philadelphia, Pa.

McCabe, J. J., 68 Cortlandt, N. Y.

Machinists Supply Co., Rochester, N. Y.

Manville, E. J. Mch. Co., W. Terbury, Conn.

Newark Mch. Tool Works, Newark, N. J.

New Haven Mfg. Co., New Haven, Conn.

New York Machinery Depot, 178 Broadway, New York.

Pittles Tool Wks., 138 Liberty St., N. Y.

Pittsburgh Mfg. Co., Pittsburgh, Pa.

Place, Geo., 120 Broadway, N. Y.  
 Pool, Robt. & Son Co., Baltimore Md.  
 Power Planer Co., Worcester, Mass.  
 Pratt & Whitney Co., Hartford, Conn.  
 Prentiss Tool & Supply Co., N. Y.  
 Scrantia Supply & Mohr Co., Scranton, Pa.  
 Sellers, Wm. & Co., Phila.  
 Seydel's Sons L. F., Philadelphia, Pa.  
 Steppe, J. & Co., Cincinnati.  
 Stow Flexible Shaft Co., Ltd., Phila.  
 Toomey, Frank, Philadelphia, Pa.  
 Wetherill, Robert & Co., Chester, Pa.  
 Wickes Bros., Saginaw, Mich.  
 Wilson, W. A., Rochester, N. Y.  
**Machinery for Hardware Manufacturers.**  
 Adt, Jno. & Son, New Haven, Conn.  
**Machine Knives.**  
 Corine Corp. & Co., Worcester, Mass.  
 Simonds Mfg. Co., Fitchburg, Mass.  
**Machine Screws.**  
 New Britain Hdw. Mfg. Co., New Britain, Conn.  
**Machine Tools.**—See *Machinery*.  
**Machine Work.**  
 Papping, J., 58th St., & 11th Ave., City.  
**Machinists' Scales.**  
 Conn & Leighton, Syracuse, N. Y.  
 Starrett, L. S., Athol, Mass.  
**Machinists' Tools and Supplies.**  
 King, J. M. & Co., Waterford, N. Y.  
 Sellers, Wm. & Co., Inc., Phila.  
**Mallets.**  
 N. Y. Mallet & Handle Works, N. Y.  
**Mangles.**  
 Johnson, S. C., Racine, Wis.  
**Manufacturing Sites.**  
 Illinois Central R. R., Chicago, Ill.  
**Measuring Tapes.**  
 Keuffel & Esser Co., New York.  
 Lufkin Rule Co., Saginaw, Mich.  
**Meat Choppers.**  
 Clauss Shear Co., Fremont, Ohio.  
**Mechanical Instruction.**  
 Correspondence School of Mechanics  
 Scranton, Pa.  
**Metals**  
 Fearing, Wm. S., 100 Chambers N. Y.  
 Hendricks Bros. & Ctn.,  
**Metal Brokers.**  
 American Metal Co., N. Y.  
**Metallurgists.**  
 Britton, J., Blodgett, Phila., Pa.  
**Milk Can Trimmings.**  
 Shepard, Sidney & Co., Buffalo, N. Y.  
**Mincing Knives.**  
 Palmer Hdw. Mfg. Co., Troy, N. Y.  
**Mine Lamps.**  
 Darby, Edw. & Sons Phila. Pa.  
 Leonard, B. E., Scranton, Pa.  
**Mining Screens.**  
 Harrington & King Perforating Co.,  
 Chicago, Ill.  
 Howard & Morse, 45 Fulton, N. Y.  
**Models, Makers of.**  
 Franklin, H. H. Mfg. Co., Syracuse,  
 N. Y.  
 Ideal Machine Works, Hartford, Conn.  
 Rhodes, L. E. Co., Hartford, Conn.  
**Molding Sand.**  
 Obermayer, S. Co., Cincinnati, O.  
**Money Drawers.**  
 Sun Mfg. Co., Greenfield, O.  
 Waddell Wooden Ware Wks., Greenfield, Ohio.  
**Motors, Water and Electric.**  
 O. & C. Electric Co., 402 and 404  
 Greenwich St., N. Y.  
 Dallatt, Thos. H. & Co., Phila., Pa.  
**Nail Keg Stock.**  
 Crescent Mfg. Co., Detroit Mich.  
**Nail Machinery.**  
 Pittsburgh Mfg. Co., Pittsburgh, Pa.  
**Nail Pullers.**  
 Graham, John H. & Co., 113 Chambers  
 Street, N. Y.  
 Scranton & Co., New Haven, Conn.  
 Specialty Mfg. Co., Hartford, Conn.  
**Nails (Cut) and Spikes.**  
 Gordon & Lovell, 70 West, N. Y.  
 Cumberland Nail & Iron Co., Phila.  
 Pottstown Iron Co., Pottstown, Pa.  
 Riverside Iron Wks., Wheeling, W. Va.  
**Nickel Platers' Supplies.**  
 Hanson & Van Winkle Co., Newark,  
 N. J.  
 Zucker & Levett Chemical Company,  
 14 Grand St., N. Y.  
**Norway Shapes, Rollers of.**  
 Bowland, William & Harvey, Frank-  
 ford, Philadelphia  
**Novelty Manufacturers.**  
 Franklin, H. H. Mfg. Co., Syracuse, N. Y.  
 Ideal Machine Works, Hartford, Conn.  
**Nut Machines.**  
 Dunham Nut Co., Unionville, Ct.  
**Nuts, Bolts, &c., Makers of.**  
 American Bolt Co., Lowell, Mass.  
 American Screw Co., Providence, R. I.  
 Blake & Johnson, Waterbury, Conn.  
 Dunham Nut Co., Unionville, Conn.  
 Haskell, Wm. H. Co., Pawtucket, R. I.  
 Mt. Carmel Bolt Co., Mt. Carmel, Conn.  
 Pennsylvania Bolt & Nut Co., Lebanon  
 Pa.  
 Port Chester Bolt and Nut Co., Port  
 Chester, N. Y.  
 Russel, Burdall & Ward, Port Chester  
 Sternberg, J. H. & Son, Reading, Pa.  
 Wilson, J. Fred., Worcester, Mass.  
 Wm. H. Haskell Co., Pawtucket, R. I.  
**Oil Cups and Lubricators.**  
 Sherwood Mfg. Co., Buffalo, N. Y.  
**Oilers.**  
 Wilmet & Hobbs Mfg. Co., Bridgeport  
 Conn.

**Oil Stones.**  
 Pike Mfg. Co., Pike Station, N. H.  
**Oil Stoves.**  
 Glazier Stove Co., Chelsea, Mich.  
**Ores.**  
 Wister, Francis, Philadelphia, Pa.  
**Ox Bow Pins.**  
 Sawyer, O. C., Sharon, Vt.  
**Ox Shoes.**  
 Scranton Forging Co., Scranton, Pa.  
**Packing.**  
 Morrison, Robert, St. Louis, Mo.  
 N. Y. Belting & Packing Co., Ltd., N. Y.  
**Padlocks.**  
 Ames Sword Co., Chicopee, Mass.  
 Frazee, E. T., Lancaster, Pa.  
 W. W. & L., Phila., Pa.  
 Shultze Mfg. Co., Phila., Pa.  
**Paint Burners.**  
 Dangler Stove & Mfg. Co., Cleveland, O.  
**Paint Cans.**  
 Wilmet & Hobbs Mfg. Co., Bridgeport,  
 Conn.  
**Pants Stretcher.**  
 Covert Mfg. Co., West Troy, N. Y.  
**Patent Solicitors.**  
 Butler, C. N., Phila., Pa.  
 Dawson & Dawson, Phila. & Wash'gton  
 Jenner, H. W. T., Washington, D. C.  
 Stocking, E. B., Washington, D. C.  
**Perforated Metal.**  
 Clinton Wire Cloth Co., Clinton, Mass.  
 Harrington & King Perforating Co.,  
 Chicago, Ill.  
 H. H. H. Mfg. Co., Ltd., Carbondale,  
 Pa.  
**Phosphor Bronze.**  
 Phosphor Bronze Smelting Co., Lim-  
 ited, Philadelphia.  
**Phosphor Tin.**  
 Crescent Phosphorized Metal Co.,  
 Philadelphia, Pa.  
 Hale & Naumann, 516 Pearl, N. Y.  
**Picks and Mattocks.**  
 Flumo, Fayette &, Philadelphia, Pa.  
**Pig Iron.**  
 Houston, C. B. & Co., Philadelphia, Pa.  
 Montour Iron & Steel Co., Danville, Pa.  
 Taylor & Co., 45 Wall, N. Y.  
 Pilling & Crane, Philadelphia, Pa.  
 Samuel, Frank, Philadelphia, Pa.  
**Pig Iron Storage.**  
 Am. Pig Iron Storage Warrant Co., 44  
 Wall, N. Y.  
**Pile Drivers.**  
 Vulcan Iron Wks., Chicago, Ill.  
**Pipe, Bent.**  
 National Pipe Bending Co., New Haven  
 Pipe Cutting and Threading Ma-  
 chines.  
 Armstrong Mfg. Co., Bridgeport, Conn.  
 Bignal & Aecker Mfg. Co., St. Louis, Mo.  
 Merrill Mfg. Co., Toledo, O.  
 Pancoast Henry B. & Co., Philadelphia.  
 Saunders' Sons, D. Yonkers, N. Y.  
 Walworth Mfg. Co., Boston, Mass.  
**Pipe Grips.**  
 Prentiss Vise Co., 44 Barclay, N. Y.  
**Pipes, Fittings, &c. Makers of.**  
 McNab & Harris Mfg. Co., N. Y.  
**Pipe, Water and Gas, Makers of.**  
 Cumberland Nail & Iron Co., Phila. Pa.  
 Donaldson Iron Co., Emaus, Pa.  
 Elkhorn Iron Works, Wheeling, W.  
 Va.  
 Wood, R. D. & Co., Philadelphia, Pa.  
**Plane Irons, Manufacturers of.**  
 Buck Bros., Millbury, Mass.  
 Buck, Chas., Millbury, Mass.  
**Planes, Manufacturers of.**  
 Stanley Rule & Level Co., N. Y.  
**Planter and Hoe.**  
 Ayers, J. R., Petersburg, Va.  
**Plated Ware.**  
 Boardman, L. & Son, New Haven, Ct.  
 Holmes & Edwards Silver Co., Bridge-  
 port, Conn.  
 Kelley & McBean, Niagara Falls, N. Y.  
 Rogers, Wm. Mfg. Co., Hartford, Ct.  
**Plate, Iron and Steel, Mfrs. of.**  
 A. & N. Standard Iron & Steel Co.,  
 Bridgeport, O.  
 Lukens Iron & Steel Co., Coatesville, Pa.  
 Mahoning Valley Iron Co., Young-  
 town, Ohio.  
 Moorhead-McLean Co., Pittsburgh, Pa.  
 McIlvain & Sons, Reading, Pa.  
 Pottstown Iron Co., Pottstown, Pa.  
 Pottsville Iron & Steel Co., Pottsville,  
 Pa.  
 Plating, Nickel, Brass and  
 Silver.  
 Wilmet & Hobbs Mfg. Co., Bridgeport,  
 Conn.  
**Plow Shares.**  
 Star Mfg. Co., Carpentersville, Ill.  
**Pokes.**  
 Bishop, A. W., Berea, Ohio.  
**Polishing Machines.**  
 Watson & Stillman, 204 E. 43d, N. Y.  
**Post Hole Diggers.**  
 Buckeye Mfg. Co., Union City, Ind.  
 Gibbs Mfg. Co., Canton, Ohio.  
 Wister, L. & Co., Philadelphia, Pa.  
**Poultry Neatings.**  
 Birmingham, R. T., Detroit, Mich.  
 Gilbert & Bennett Mfg. Co., 42 Cliff  
 St., N. Y.  
 N. Y. Wire Cloth Co., Trenton, N. J.  
 "Silver Finish."  
 Tyler Wire Wks. Co., W. S., Cleveland,  
 O.  
 Wright & Colton Wire Cloth Co.,  
 Worcester, Mass.  
**Powder.**  
 Laffin & Rand Powder Co., 29 Murray  
 New York Powder Co., 62 Liberty St.,  
 N. Y.  
**Power Hack Saws.**  
 Miller's Falls Co., 93 Reade St., N. Y.  
**Power Hammers.**  
 J. E. & Eisenhardt, Philadelphia.  
 Dupont Mfg. Co., St. Johnsbury, Vt.  
 Jenkins & Linglie, Bellerton, Pa.  
 Long & Alstatter Co., Hamilton, Ohio  
 Scranton Co., New Haven, Conn.  
**Presses, Dies, &c.**  
 A. W. Bush Co., Brooklyn, N. Y.  
 Crosby, G. A. & Co., Chicago, Ill.  
 Ferracuti Mfg. Co., Bridgeton, N. J.  
 Stark Mch. & Tool Co., Buffalo, N. Y.  
 Stiles & Parker Press Co., Brooklyn,  
 N. Y.  
 Waterbury Mch. Co., Waterbury, Conn.  
**Presses, Power, Makers of.**  
 Biles, E. W. Co., Brooklyn, N. Y.  
 Manville, E. J. Mch. Co., Waterbury, Ct.  
 Merriman, A. H., Meriden.  
 Stark Mch. & Tool Co., Buffalo, N. Y.  
 Waterbury Farrel Foundry and Ma-  
 chine Co., Waterbury, Conn.  
**Pruners.**  
 Topliff & Ely Co., Elyria, Ohio.  
**Pulleys.**  
 Keystone Clutch Mch. Wks., Phila.,  
 Pa.  
 Lake, J. H. & Co., Massillon, Ohio.  
 Reeves Pulley Co., Columbus, Ind.  
**Pumping Machinery.**  
 Dean Bros. Steam Pump Works, In-  
 dianapolis, Ind.  
 Hooker-Coville Steam Pump Co., St.,  
 Louis, Mo.  
 Lucas, C. O. & Co., Greenville, Ohio.  
 McGowan, J. H. & Co., Cincinnati, O.  
 Maslin, J. & Son, Jersey City, N. J.  
 Norwalk Iron Wks. Co., So. Norwalk,  
 Conn.  
 Southwark Fdy. & Mch. Co., Phila., Pa.  
 Valley Pump Wks., Easthampton, Mass.  
 Worthington, Henry R., 86 & 88 Liberty  
 St., N. Y.  
**Pumps, Makers of.**  
 Bellevue Pump Co., Bellevue, Iowa.  
 Deming Co., Salem, O.  
 Douglas, W. B., Middletown, Conn.  
 Mast, Foss & Co., Springfield, O.  
 Myers, F. E. & Bro., Ashland, O.  
**Punches.**  
 Richards, I. P., Providence, R. I.  
**Punches and Shears, Hand and**  
 Power.  
 E. W. Bush Co., Brooklyn, N. Y.  
 Crosby, G. A. & Co., Chicago, Ill.  
 Cross & Speare Machine Co., Water-  
 bury, Conn.  
 Ferracuti Mch. Co., Bridgeton, N. J.  
 Henderer, A. L., Wilmington, Del.  
 Long & Alstatter Co., Hamilton, Ohio.  
 Stark Mch. & Tool Co., Buffalo, N. Y.  
 Stiles & Parker Press Co., Brooklyn,  
 N. Y.  
 Wais & Roos Punch & Shear Co.,  
 Cincinnati, Ohio.  
 Waterbury Farrel Foundry and Mch.  
 Co., Waterbury, Conn.  
 Watson & Stillman, 204 E. 43d, N. Y.  
**Rails, Old and New.**  
 Perry, W. H. & Co., Providence, R. I.  
**Rat and Mouse Traps.**  
 Estey, W. S., 60 Fulton, N. Y.  
 Ripley Mfg. Co., Unionville, Conn.  
 Sun Mfg. Co., Greenfield, O.  
**Razors.**  
 J. K. Torrey Razor Co., Worcester,  
 Mass.  
**Reels.**  
 Hendry, A. B. Co., New Haven, Conn.  
**Refrigerators.**  
 Monroe Refrigerator Co., Lockland, O.  
 Pierce, Geo. N. & Co., Buffalo, N. Y.  
**Refrigerator Door Fasteners.**  
 Conroy, F. J. & Co., Philadelphia.  
**Rivets.**  
 Blake & Johnson, Waterbury, Conn.  
 Boyce Rivet Co., Muncie, Ind.  
 Burden Iron Co., Troy, N. Y.  
 Clark & Cowles, Plainville, Conn.  
 Cobb & Drew, Plymouth, Mass.  
 New England Screw Co., Boston, Mass.  
 Sternberg, J. H. & Son, Reading, Pa.  
 Townsend, W. P. & Co., New Brighton,  
 Pa.  
**Riveting Machines.**  
 Adt, Jno. & Sons, New Haven, Conn.  
**Rock Drills.**  
 Sand Drill Co., 23 Park Place, N. Y.  
**Rolling Mill Machinery.**  
 Birmingham Iron Wks., Birmingham,  
 Conn.  
 Booth, The Lloyd, Co., Youngstown, O.  
 Leechburg Foundry & Mch. Co., Pitts-  
 burgh, Pa.  
 Moran Construction Co., Worcester,  
 Mass.  
 Robinson-Bea Mfg. Co., Pittsburgh,  
 Pa.  
 Treteway Mfg. Co., Pittsburgh, Pa.  
 Waterbury Farrel Foundry & Mch.  
 Co., Waterbury, Conn.  
**Rolls, Chilled, Sand and Steel.**  
 Birmingham Iron Foundry, Birming-  
 ham, Conn.  
 Sooth, The Lloyd, Co., Youngstown, O.  
 East Chicago Fdy. Co., Chicago, Ill.  
 Garrison, A. Fdy. Co., Pittsburgh, Pa.  
 Robinson-Bea Mfg. Co., Pittsburgh, Pa.  
 Seaman, Sleeth & Black, Pittsburgh,  
 Pa.  
 Totten & Hogg Iron and Steel Fdy. Co.,  
 Pittsburgh, Pa.  
**Roofing.**  
 Americardine Roofing Co., Cambridge, O.  
 Cincinnati Corrugating Co., Piqua, O.  
 Kanneberg Roofing Co., Canton, O.  
 N. Y. Iron Roofing & Corrugating Co.,  
 Jersey City, N. J.  
**Rope and Web Goods.**  
 Covert Mfg. Co., West Troy, N. Y.  
 Covert's Saddlery Wks., Farmer, N. Y.  
**Rope Wheels.**  
 Cresson, Geo. V. Co., Philadelphia, Pa.  
**Rubber Goods.**  
 Canfield, H. O., Bridgeport, Conn.  
**Rules, Manufacturers of.**  
 Keuffel & Esser Co., New York.  
 Lufkin Rule Co., Saginaw, Mich.  
 Stanley Rule & Level Co., 21 Chambers.  
**Rust Preventive.**  
 Bridgeport Gun Implement Co., 313-  
 315 Broadway, N. Y.  
**Sand Paper.**  
 Baeder, Adamson & Co., Phila., Pa.  
**Sash Balances.**  
 Caldwell Mfg. Co., Rochester, N. Y.  
 Pullman Sash Balance Co., Rochester,  
 N. Y.  
 Stearns, E. C. & Co., Syracuse, N. Y.  
**Sash Cords and Chains.**  
 Morton, Thos., 60 Elizabeth, N. Y.  
 Ossawam Mills Co., Norwich, Conn.  
 Samson Cordage Works, Boston, Mass.  
 Smith & Egge, Mfg. Co., Bridgeport.  
**Sash Locks.**  
 Columbian Sash & Door Lock Co.,  
 Wauseon, Ohio.  
 Ives, H. B. & Co., New Haven, Conn.  
**Sash Pulleys.**  
 Palmer Hardware Mfg. Co., Troy, N. Y.  
**Sash Weights.**  
 Brown, E. K. & Co., Philadelphia, Pa.  
 Norton Bros., Chicago, Ill.  
**Saw Filing Machines.**  
 Distant, Henry & Sons, Philadelphia,  
 Pa.  
**Saws, Makers of.**  
 Butler Mfg. Co., Boston, Mass.  
 Distant, Henry & Sons, Phila., Pa.  
 National Saw Co., 98 Reade St., N. Y.  
 Simonds Mfg. Co., Fitchburg, Mass.  
**Saw Vises.**  
 Seneca Falls Mfg. Co., Seneca Falls,  
 N. Y.  
**Saw Sets.**  
 Taintor Mfg. Co., 84-86 Chambers N. Y.  
**Scales, Manufacturers of.**  
 Buffalo Scale Co., Buffalo, N. Y.  
 Chatillon, John & Sons, 85-87 Cliff, N. Y.  
**Scrapers, Road.**  
 Am. Steel Scraper Co., Sidney, Ohio.  
 Kilbourne & Jacobs Mfg. Co., Colum-  
 bus, O.  
 Sidney Steel Scraper Co., Sidney, O.  
**Screen Co., Coal and Ore.**  
 Henrick Mfg. Co., Ltd., Carbondale,  
 Pa.  
**Screens, Door and Window.**  
 White, Van Glahn & Co., 15-17 Chatham  
 Sq., N. Y.  
**Screw Cutting Machinery.**  
 Wells Bros. & Co., Greenfield, Mass.  
 Wiley & Russell Mfg. Co., Greenfield,  
 Mass.  
**Screw Drivers.**  
 Brown, R. H. & Co., New Haven, Conn.  
 Mayhew, H. H. Co., Shelburne Falls,  
 Mass.  
**Screw Plate and Pipe Cutter.**  
 Jarecki Mfg. Co., Erie, Pa.  
**Screws, Makers of.**  
 American Screw Co., Providence, R. I.  
 Blake & Johnson, Waterbury, Conn.  
 Wm. H. Haskell Co., Pawtucket.  
 Miles, F. S., 206 Quarry, Boston, Mass.  
 Reynolds & Co., New Haven, Conn.  
 Worcester Machine Screw Co., Worcester,  
 Mass.  
**Scroll Saws.**  
 Barnes, W. F. & John, Rockford, Ill.  
 Seneca Fall Mfg. Co., Seneca Falls, N. Y.  
**Scytes Stones and Whetstones.**  
 Pike Mfg. Co., Pike St., N. H.  
 Cleveland Stone Co., Cleveland, O.  
**Sewing Machines.**  
 Household Sewing Machine Co., Prov-  
 idence, R. I.  
**Shafting, Makers of.**  
 Cresson, Geo. V. Co., Philadelphia, Pa.  
 Fairmount Mch. Co., Philadelphia, Pa.  
 Fitzsimons & Co., Cleveland, Ohio.  
 Sellers, Wm. & Co., Inc., Phila., Pa.  
 Stow Mfg. Co., Binghamton, N. Y.  
**Shaped Iron and Steel, Manufacturers of.**  
 Atma-Standard Iron & Steel Co.,  
 Bridgeport, O.  
 East Chicago Fdy. Co., Chicago, Ill.

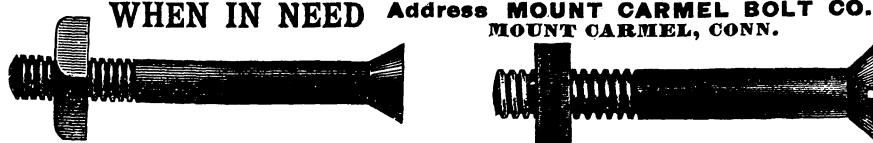
Allentown Rolling Mill, Allentown, Pa.	Timber and Mineral Lands.
Lockhart Iron & Steel Co., Pittsburgh, Pa.	Robertson, E. Co., Cincinnati, O.
Passaic Rolling Mill Co., Paterson, N.J.	Time Record.
Pottsville Iron & Steel Co., Pottsville, Pa.	Scattergood, H. W., Phila., Pa.
Roberts, A. & P. Co., Phila., Pa.	Tinning Process.
The Phoenix Iron Co., Phila., Pa.	Sands, Thomas, Nashua, N.H.
Udor Iron Works St. Louis, Mo.	Tin Plate Machinery.
Shears and Scissors.	Lloyd Booth Co., Youngstown, Ohio.
Acme Shear Co., Bridgeport, Conn.	Tinware.
Heinrichs, R. Sons Co., Newark, N.J.	Am. Stamping Co., 104 & 106 John St.,
Sheet Iron and Steel, Manufacturers of.	Tire Upsetters.
Etna-Standard Iron and Steel Co., Bridgeport, O.	Butts & Ordway, Boston, Mass.
Cambridge Iron & Steel Co., Cambridge, Ohio.	Toe Calks, Steel.
Chess Bros., Pittsburgh, Pa.	Surke, P. F., Boston, Mass.
Manoning Valley Iron Co., Livingston, Ohio.	Tool Blocks.
Morehead-McCleane Co., Pittsburgh, Pa.	Hulbert-Rogers Mch. Co., South Sudbury, Mass.
Pierson & Co., 29 Broadway, N.Y.	Tool Chests.
Singer Nimick & Co., Ltd., Pittsburgh, Pa.	Am. Tool Co., 200 W. Houston St., N.Y.
The Mahoning Valley Iron Co., Youngstown, O.	Tool Holders.
Alan Wood Co., Philadelphia.	Armstrong Bros. Tool Co., Chicago, Ill.
W. Dewees Wood Co., McKeesport, Pa.	Tools.
Sheet Zinc.	Brown, R. H. & Co., New Haven, Conn.
Matthiessen & Hegeler Zinc Co., La Salle, Ill.	Frasce Co., 19 Warren St., New York.
Sinks.	Mayhew, H. H. Co., Shelburne Falls, Mass.
Douglas, W. & B., Middletown, Conn.	Millers Falls Co., 98 Read St., N.Y.
Skates, Ice.	Richardson, C. F. & Son, Athol, Mass.
Lovell, Jno. P. Arms Co., Boston, Mass.	Stanley Rule & Level Co., 29 Chambers, Starrett, L. S., Athol, Mass.
Winslow, Sam'l, Skate Mfg. Co., Worcester, Mass.	Tower & Lyon, 95 Chambers St., N.Y.
Skates, Roller.	Wilkinson, A. J. & Co., Boston, Mass.
Henley, M. C., Richmond, Ind.	Tools, Blacksmith and Wheelwrights.
Union Harware Co., Torrington, Conn.	Buffalo Forge Co., Buffalo, N.Y.
Winslow, Sam'l, Skate Mfg. Co., Worcester, Mass.	Butts & Ordway, Boston, Mass.
Smelting Works.	Champion Blower & Forge Co., Lancaster, Pa.
Reeves, Paul S., 700 S. Broad, Phila.	Plumb, Fayette R., Philadelphia, Pa.
Soldering Coppers.	Wiley & Russell Mfg. Co., Greenfield, Mass.
Cleindon Bros., Baltimore, Md.	Tools, Steam and Gas Fitters.
Covert Mfg. Co., West Troy, N.Y.	Saunders' Sons, D., Yonkers, N.Y.
Speaking Tubes.	Torches, Oil and Gasoline.
Ostrander, W. R. & Co., 204 Fulton St., N.Y.	Dangler Stove & Mfg. Co., Cleveland, O.
Wollensak, J. F., Chicago, Ill.	Schneider & Trenkamp Co., Cleveland, Ohio.
Specialties, Pat. Articles.	Transom Lifters.
Rhodes, L. E. Co., Hartford, Conn.	Wollensak, J. F., Chicago, Ill.
Spelter.	Tricycles.
Matthiessen & Hegeler Zinc Co., La Salle, Ill.	Toledo Metal Wheel Co., Toledo, Ohio.
Missouri Metal Co., St. Louis, Mo.	Trucks, Manufacturers of.
Spoons and Forks.	Clark, G. P., Windsor Locks, Conn.
Boardman, L. & Son, New Haddam, Conn.	Tubes, Seamless Drawn Copper.
Holmes & Edwards Silver Co., Bridgeport, Conn.	Ansonia Brass & Copper Co., 19 and 21 Cliff, N.Y.
Kelley & McBean, Niagara Falls, N.Y.	Randolph & Clowes, Waterbury, Conn.
Rogers, The Wm. Mfg. Co., Hartford, Conn.	Tubes, Steel.
Sporting Goods.	Henderson Bros., Waterbury, Conn.
Hartley & Graham, 813-815 B'way, N.Y.	Turnbuckles.
Springs.	Cleveland City Forge & Iron Co., Cleveland, O.
Clark & Cowles, Plainville, Ct.	Merrill Bros., Brooklyn, E.D.
Dubar Bros., Bristol, Conn.	Twist Drills, Makers of.
Miller & Van Winkle, Brooklyn, N.Y.	Cleveland Twist Drill Co., Cleveland, Morse Twist Drill & Machine Co., New Bedford, Mass.
Morgan Spring Co., Worcester, Mass.	New Process Twist Drill Co., Taunton, Mass.
Roland, Wm. & Harvey, Phila., Pa.	Standard Tool Co., Cleveland.
Sabin Machine Co., Montpelier, Vt.	Valves, Gas, Water and Steam.
Tuck Mfg. Co., Brockton, Mass.	Best, Fox & Co., Pittsburgh, Pa.
Washburn & Moen Mfg. Co., Worcester, Mass.	Chapman Valve Mfg. Co., Boston.
Wolf, R. H. & Co., Ltd., 118th St. and Harlem River, N.Y.	Eynon-Evans Mfg. Co., Philadelphia, Pa.
Spring Hinges.	Jenkins Bros., 71 John, N.Y.
Bommer Bros., Brooklyn, N.Y.	Lunkenheimer Co., Cincinnati, O.
Pullman Sash Balance Co., Rochester, N.Y.	McNab & Harlin Mfg. Co., 66 John, N.Y.
Stover Mfg. Co., Freeport, N.Y.	Ventilating Fans.
Van Wagoner & Williams Hdw. Co., 14 Warren St., N.Y.	Euyett & Smith Mfg. Co., Detroit, Mich.
Stamped Ware.	Ventilator Appliances.
Am. Stamping Co., 104 & 106 John St., New York	Howard & Morse, 16 Fulton St., N.Y.
Stamping Works.	Vise Jaws.
Avery Stamping Co., Cleveland, O.	Newark Mch. Tool Co., Newark, N.J.
Cleveland Stamping & Tool Co., Cleveland, O.	Vises.
Staples.	Athol Machine Co., Athol, Mass.
Cobb & Drew, Plymouth, Mass.	Hollands Mfg. Co., Erie, Pa.
Titchener, E. H. & Co., Binghamton, N.Y.	Howard Iron Works, Buffalo, N.Y.
Steam Gauges.	Millers Falls Co., 98 Read St., N.Y.
Bristol Co., Waterbury, Conn.	Prentiss Vise Co., 44 Barclay N.Y.Y.
Steam Hammers, &c., Makers of.	Tower & Lyon, 95 Chambers St., N.Y.
Deneit & Eisenhardt, Philadelphia, N.Y.	Wagon Jacks.
Dudgeon, Richard, 24 Columbia Street, N.Y.	Covert Mfg. Co., West Troy, N.Y.
Trethewy Mfg. Co., Pittsburgh, Pa.	Covert's Saddlery Works, Farmer, N.Y.
Steam Heating.	Washers.
Webster Warren & Co., Camden, N.J.	Haskell, Wm. H. Co., Princeton, R.I.
Steam Separators.	Milton Mfg. Co., Milton, Pa.
Gouoert Mfg. Co., 32 Cortland St., N.Y.	Sternbergh, J. H. & Son, Reading, Pa.
Harrison Safety Boiler Wks., Phila., Pa.	Wash Boards.
Steam Specialties.	Olds Wagon Wks., Ft. Wayne, Ind.
Lunkenheimer Co., Cincinnati, O.	Washing Machines.
Steel, Cold Rolled Strip.	Dietrich & Barrows, Ft. Wayne, Ind.
Superior Steel Co., Pittsburgh, Pa.	Wayne, Anthony Mfg. Co., Ft. Wayne, Ind.
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.	Water Meters.
Steel Figures and Alphabets.	Worthington, Henry R., 86 & 88 Liberty St., N.Y.
Krogsrud, W., 61 Fulton St., N.Y.	

See Alphabetical Index, Pages 103 & 104

# ALPHABETICAL INDEX TO ADVERTISERS.

Abbott, Wheelock & Co.	18	Buck, Chas.	66	Cross & Speirs Machine Co.	38	Gurney, F. B.	67
Alstite Aluminum Co.	13	Buckeye Mfg. Co.	93	Crown Smelting Co.	3	Gwinne Mfg. Co.	73
Acme Shear Co.	67	Buffalo Forge Co.	106	Cumberland Nail & Iron Co.	15	Haight & Clark.	23
Adt, John & Son.	35	Buffalo Scale Co.	90	Cushman Chuck Co.	42	Haines & Zimmermann.	72
Etna-Standard Iron & Steel Co.	18	Burden Iron Co.	87	Dallett, Thos. H. & Co.	44	Haines Gauge Co.	28
Aiken, Henry.	26	Burke, P. F.	89	Dame, Stoddard & Kendall.	71	Halk & Naumann.	3
Alexander Bros.	34	Burr & Houston Co.	21	Dangler Stove & Mfg. Co.	75	Halsey, Jas. T.	42
Allentown Rolling Mills.	25	Bussenius & Cunliffe.	49	Darby, Edw. & Sons.	8	Halsey, W. S. & Co.	22
Am. Bolt Co.	97	Butler, C. N.	6	Davis, I. B. & Son.	29	Hamilton Machine Tool Co.	37
Am. Metal Co.	8	Butler Mfg. Co.	64	Davis, W. P.	49	Hammer & Co.	90
Am. Pig Iron & Storage Warrant Co.	17	Butterfield & Co.	42	Davol, John & Sons.	2	Hanson & Van Winkle Co.	32
Am. Screw Co.	11	Butts & Ordway.	44	Dayton Malleable Iron Co.	106	Hardware Board of Trade.	62
Am. Stamping Co.	65	C. & C. Electric Co.	32	Dean Bros. Steam Pump Works.	33	Harrington, E., Son & Co.	46
Am. Steel Scraper Co.	92	Caldwell Mfg. Co.	84	Deitz, A. E.	80	Harrington & King Perforating Co.	9
Am. Tool Co.	66	California Wire Works.	6	Deming Co.	60	Harrington & Richardson Arms Co.	69
American Tool Works.	49	Cambria Iron Co.	17	Detrick & Harvey Machine Co.	47	Harrison Safety Boiler Wks.	27
Ames Sword Co.	84	Cambridge Iron & Steel Co.	18	Detroit Foundry Equipment Co.	24	Hart Mfg. Co.	42
Ansonia Brass & Copper Co.	2	Cambridge Roofing Co.	13	Diamond Clamp & Flask Co.	106	Hartford Steam Boiler Insp. and Ins. Co.	29
Arcade File Works.	64	Canfield, H. O.	35	Diamond State Iron Co.	87	Hartley & Graham.	1
Arcade Malleable Iron Co.	20	Capeowell Horse Nail Co.	88	Dieffenbacher, W. H. & Co.	69	Haskell, Wm. H. Co.	98
Armstrong Bros. Tool Co.	47	Carbon Steel Co.	18	Dienelt & Eisenhardt.	39	Hazard Mfg. Co.	6
Armstrong Mfg. Co.	41	Carlton's Sons, Thomas.	49	Diether & Barrows.	80	Heath, S. F. Cycle Co.	72
Artificial Gas Engineering Co.	26	Carpenter, J. M. Tap & Die Co.	105	Diez, Schumacher & Co.	40	Heinisch's R. Sons Co.	67
Athol Machine Co.	61	Cary Mfg. Co.	69	Dille & Anderson.	96	Henderer, A. L.	36
Atlas Tack Corporation.	10	Chadborne & Coldwell Mfg. Co.	95	Dille & McGuire Mfg. Co.	95	Henderson Bros.	21
Avery Stamping Co.	75	Chambers Bros. Co.	98	Disston, Henry & Sons.	63	Hendey Machine Co.	56
Ayers, J. R.	98	Champion Blower & Forge Co.	42	Dixon, Jos., Crucible Co.	35	Hendricks Bros.	2
Babcock & Wilcox Co.	31	Champion Iron Co.	7	Dodd, A. W. & Co.	105	Hendrick Mfg. Co., Ltd.	7
Baeder, Adamson & Co.	58	Champion Mfg. Co.	94	Donaldson Iron Co.	21	Hendryx, A. B. Co.	3
Banker & White.	65	Chandler & Taylor Co.	26	Douglas, W. & B.	60	Henley, M. C.	69&95
Bardsley, J.	90	Chapman Valve Mfg. Co.	29	Draper Machine Tool Co.	49	Herrick, J. A.	25
Barns, C. K. & Co.	20	Chatillon, John & Sons.	77	Dudgeon, Richard.	40	Herrick & Cowell.	37
Barnes, W. F. & John.	38	Cheney, S. & Son.	21	Dunbar Bros.	5	Hjertz, T. & Son.	4
Barnett, G. & H.	65	Chess Bros.	21	Dunham Nut Co.	97	Hill, Clarke & Co.	50
Barnum, E. T.	8	Chester Steel Casting Co.	22	Dupont Mfg. Co.	36	Hobson, F., Seaman & Co.	16
Bass Foundry & Machine Works.	27	Chicago Wrought Butt & Hinge Co.	83	Durant, W. N.	34	Hoffman, C. & A.	66
Bay State Stamping Co.	15	Chrome Steel Works.	17	Dwight slate Machine Co.	41	Hoffman, J. W. & Co.	15
Bell, J. W. & Co.	66	Church, Isaac.	98	Eagle Bicycle Mfg. Co.	105	Hogan, John L. & Co.	15
Bellevue Pump Co.	61	Cincinnati Corrugating Co.	13	East Chicago Foundry Co.	21	Hoggson & Pettis Mfg. Co.	37
Bement, Miles & Co.	39	Cincinnati Mfg. Co.	73	Eccles, Richard.	85	Hollands Mfg. Co.	61
Bemis & Call Hardware & Tool Co.	90	Clafien Mfg. Co.	35	Egan Co.	45	Holmes & Edwards Silver Co.	68
Berger Bros.	77	Clapp, Geo. M.	50	Enterprise Mfg. Co. of Pa.	75	Hooker-Colville Steam Pump Co.	50
Best, Fox & Co.	3	Clark, G. P.	93	Erie Engine Works.	28	Household Sewing Machine Co.	81
Bethlehem Iron Co.	20	Clark & Cowles.	4&50	Este, W. S.	6	Houston, C. B. & Co.	15
Bevin Bros. Mfg. Co.	71	Clark Mfg. Co.	84	Ette & Henger Mfg. Co.	93	Howard Iron Works.	65
Bickford Drill & Tool Co.	46	Clarke, Thomas.	77	Etting, Edw. J.	15	Howard & Morse.	7
Bicycle Step Ladder Co.	54	Clauss Shear Co.	69	Eureka Cast Steel Co.	108	Howson & Howson.	6
Bigelow, C. R.	50	Clement & Dunbar.	59	Evans-Friction Cone Co.	3	Hudson, C. E. & Co.	81
Bignall & Keeler Mfg. Co.	39	Clendenin Bros.	12	Eynon-Evans Mfg. Co.	29	Hurlbut-Rogers Mch. Co.	43
Billings & Spencer Co.	90	Cleveland Block Co.	85	F. & N. Mfg. Co.	95	Huyett & Smith Mfg. Co.	37
Bingham, W. Co.	72	Cleveland City Forge & Iron Co.	1	Fairmount Machine Co.	47	Ideal Machine Works.	55
Birmingham Iron Foundry.	21	Cleveland Fence Co.	9	Fearing, Wm. S.	2	Ideal Mfg. Co.	72
Bishop, A. W.	59	Cleveland Stamping & Tool Co.	78	Ferracutte Machine Co.	37	Illinois Pure Aluminum Co.	75
Bissell, E. Son & Co.	52	Cleveland Stone Co.	45	Fitch, W. & E. T.	105	Indiana Bicycle Co.	73
Blair Mfg. Co.	93	Cleveland Twist Drill Co.	44	Fitchburg Machine Works.	34	Indiana Wire Fence Co.	7
Blake & Johnson.	12	Clinton Wire Cloth Co.	8	Fitzsimons & Co.	15	Ives, H. B. & Co.	80
Bliss Co., E. W.	36	Cobb & Drew.	9	Flagg, Stanley G. & Co.	106	Jacobus, W. H.	98
Boardman, L. & Son.	67	Coburn Trolley Track Mfg. Co.	82	Fraim, E. T.	84	Jarecki Mfg. Co.	41
Boker, Hermann & Co.	16	Coes, Loring & Co.	91	Frankford Steel Co.	17	Jeffrey Mfg. Co.	34
Bommer Bros.	84	Coffin Wrench Co.	91	Franklin, H. H. Mfg. Co.	50	Jenkins Bros.	1
Bond Nail Co.	12	Coffin & Leighton.	41	Frasse Co.	58	Jenkins & Lingle.	38
Boone, W. C. Mfg. Co.	22	Colburn, A. M.	42	Frost Thill Spring Co.	89	Jenner, H. W. T.	6
Booth, The Lloyd Co.	23	Colby Wringer Co.	77	Fulton Iron & Engine Works.	46	Jesop, Wm. & Sons.	16
Borden & Lovell.	8	Coldwell Lawn Mower Co.	91	Fulton Steam Boiler Wks & Foundry	26	Johnson, I. H., Jr., & Co.	46
Borgner, Cyrus.	23	Columbian Sash & Door Lock Co.	74	Gardner, Jas. & Son.	23	Johnson, S. C.	76
Boston Gear Works.	27	Conroy, P. J. & Co.	89	Garrison, A., Foundry Co.	23	Jones, B. M. & Co.	18
Bourke Mfg. Co.	60	Continental Iron Works.	27	Gartland Foundry Co.	20	Jones, M. D. & Co.	80
Box, Alfred & Co.	47	Corbin, P. & F.	82	Garvin Machine Co.	45	Jones & Lamsen Machine Co.	56
Boyce Rivet Co.	106	Corning, Edw. & Co.	14	Gautier Steel Department.	13	Jones, Jesse & Co.	62
Bradlee & Co.	14	Cramp, Wm. & Sons S. & E. B. Co.	3	Gaylord, F. L. Co.	3	Kanneberg Roofing Co.	13
Brass Goods Mfg. Co.	2	Cotton, Barclay W. & Co.	14	Gibbs Mfg. Co.	95	Kay, J. F.	4
Bridgeport Gun Implement Co.	69	Covert Mfg. Co.	87	Gilbert & Bennett Mfg. Co.	8	Kayser, Ellison & Co.	16
Bridgeport Mch. Tool Works.	48	Covert's Saddlery Works.	57	Gladzer Stove Co.	57	Jersey, Jerome & Co.	15
Briggs, Marvin.	50	Cox, Justice, Jr.	15	Gleason Tool Co.	26	Kelley & McBean.	72
Bristol Co.	1	Cross, Wm. & Sons S. & E. B. Co.	3	Glenmon, J. & Co.	94	Kennedy, Julian.	26
Britton, J. Blodgett.	25	Crawford Mfg. Co.	73	Goddard, Asa.	44	Keuffel & Esser Co.	61
Broderick & Bascom Rope Co.	6	Crescent Horse Shoe & Iron Co.	89	Goodell Co.	68	Keys, W. W. & R. M. Co.	3
Bromwell Brush & Wire Goods Co.	10&59	Crescent Mfg. Co.	12	Goubert Mfg. Co.	31	Keystone Clutch & Machine Works.	42
Bronson Supply Co.	77	Crescent Phosphorized Metal Co.	8	Gould & Eberhardt.	34	Kilbourne & Jacobs Mfg. Co.	92
Brown, E. E. & Co.	85	Crescent Steel Co.	17	Graham, John H. & Co.	76	Kilmer Mfg. Co.	7
Brown Hoisting & Conveying Mch. Co.	34	Cresson, Geo. V. Co.	43	Grand Crossing Tack Co.	10	King & Andrews.	55
Brown, R. H. & Co.	58	Croissant, M.	76	Grand Rapids Cycle Co.	72	King, J. M. & Co.	65
Bryan Mfg. Co.	92	Crosby, G. A. & Co.	88	Green, A. H.	97	Knapp & Cowles Mfg. Co.	62
Bryden Horse Shoe Co.	87					Kohler, F. E. & Co.	93

Kreischer, B. & Sons.....	23	New Haven Mfg Co .....	37	Riehlé Bro Testing Machine Co.....	36	Talcott, W. O.....	35
Krogsvrud, W.....	62	New Haven Wire Mfg Co.....	6	Ripley Mfg. Co.....	77	Tatum, Sam. C. & Co ..	81
La Belle Steel Co.....	19	N. J. Wire Cloth Co.....	8	Riverside Iron Works.....	18	Taunton Locomotive Mfg. Co.....	30
Lafin & Rand Powder Co.....	21	New Process Twist Drill Co.....	44	Roberts, A. & P. & Co.....	17	Taunton Wire Nail Co.....	7
Lake, J. H. & D. Co.....	42	Newton & Shipman.....	16	Roberts Mfg. Co.....	34	Thomson, W. H. & Co.....	15
Lane Brothers.....	84	N. Y. Belting & Packing Co.....	35	Robertson, E. C.....	53	Tiebout, W. & J.....	85
Lane & Bodley Co.....	26	N. Y. Gas Saving Co.....	58	Robinson-Rea Mfg. Co.....	22	Titchener, E. H. & Co.....	7
Laughlin, Alex & Co.....	26	N. Y. Mallet & Handle Works.....	61	Rogers, The Wm. Mfg. Co.....	68	Tod, Wm. & Co.....	27
Lay, Jos. & Co.....	78	N. Y. Powder Co.....	21	Rollason Gas Engines.....	29	Toledo Wheelbarrow Works.....	98
Lea, J. Tatnall & Co.....	19	N. Y. Iron Roofing & Corrugating Co.	10	Rome Brass & Copper Co.....	2	Toledo Metal Wheel Co.....	72
Lean, D. R. Co.....	25	Nicholson File Co.....	63	Rowland, Wm. & Harvey.....	108	Toomey, Frank.....	50
League Cycle Co.....	105	Nicolls, Wheeler & Co.....	14	Russell, Burdsall & Ward.....	108	Topliff & Ely Co.....	91
Le Count, C. W.....	89	Niles Tool Works.....	51	Russia Cement Co.....	59	Torrey, J. R. Razor Co .....	67
Leechburg Foundry & Machine Co.....	21	North Bros. Mfg. Co.....	17 & 57	St. Louis Bronze & Aluminum Works	3	Totten & Hogg Iron and Steel Fdry.	
Leng's, Jno. S. Son & Co.....	106	Northampton Cutlery Co.....	68	Sabin Machine Co.....	5	Co.....	27
Leonard, B. E.....	91	Northampton Emery Wheel Co.....	45	Salem Wire Nail Co.....	12	Tower & Lyon.....	70
Leonard, J.....	20	Norton Bros.....	85	Samson Cordage Works.....	1	Townsend, W. P. & Co.....	98
Leschen, A. & Sons Rope Co.....	6	Norton Emery Wheel Co.....	45	Samuel, Frank.....	14	Trenton Iron Co.....	4
Levis, Henry & Co.....	20	Norton & Jones Machine Tool Works.	42	Sands, Thomas.....	54	Trethewey Mfg. Co.....	26
Lidgerwood Mfg. Co.....	106	Norwalk Iron Works Co.....	38	Saunders' Sons, D.....	40	Trimont Mfg. Co.....	90
Lindsay, Jas. G. & Co.....	15	Nubian Iron Enamel Co.....	54	Sawyer, O. C.....	68	Tuck Mfg. Co.....	4
Link-Belt Engineering Co.....	38	Obermayer, S. Co.....	20	Scattergood, H. W.....	54	Tudor Iron Works.....	1
Lockhart Iron & Steel Co.....	19	Ogden & Wallace.....	20	Scheeler & Sons.....	5	Tyler Wire Works Co. W. S.....	56
Long & Allstatter Co.....	37	Old Dominion Iron & Nail Works Co.	89	Schneider & Trenkamp Co.....	74	Union Hardware Co.....	70
Lovell, Jno. P. Arms Co.....	72	Olds Wagon Works.....	78	Schultze Mfg. Co .....	81	Union Mfg. Co.....	43
Lovegrove & Co.....	50	Ossawan Mills Co.....	105	Scott, Geo. M.....	34	Union Metallic Cartridge Co.....	1
Lucas, C. O. & Co.....	32	Ostrander Fire Brick Co.....	23	Scoville Mfg. Co.....	2	U. S. Projectile Co.....	40
Ludlow-Saylor Wire Co.....	7	Ostrander, W. R. & Co.....	61	Séranton & Co.....	38	Valentine, M. D. & Bro.....	23
Lufkin Rule Co.....	60	Otto Gas Engine Works.....	30	Scranton Forging Co.....	87	Valley Pump Works.....	33
Lukens Iron & Steel Co.....	14	Packer, C. W.....	57	Scranton Supply & Machine Co.....	49	Van Dorn Iron Works Co.....	7
Lundberg, Gustaf.....	16	Palmers & De Mooy.....	22	Seaman, Sleeth & Black.....	21	Van Wagoner & Williams Hdw. Co.	106
Lunkenheimer Co.....	23	Palmer Hardware Mfg. Co.....	53	Sebastian Lathe Co.....	51	Victor Mfg. Co.....	85
McCabe, J. J.....	49	Pancoast Henry B. & Co.....	41	Sellers, Wm. & Co.....	47	Vulcan Iron Works.....	26
McCaffrey File Co .....	65	Passaic Rolling Mill Co.....	20	Seneca Falls Mfg. Co.....	46 & 62	Waddel Wooden Ware Wks.....	79
McCallip Fence & Wire Works....	10	Peabody & Parks.....	77	Sessions Foundry Co.....	22	Wahl & Roos Punch & Shear Co .....	37
McClure & Amsler.....	25	Peck, A. G. & Co.....	106	Seyfert's Sons, L. F .....	49	Walbridge & Co.....	64
McCoy, Jos. F. & Co.....	32	Pennsylvania Bolt & Nut Co.....	97	Shelby Steel Tube Co.....	21	Wallace Wm. H. & Co.....	20
McFarland, Wm.....	4	Penna. Diamond Drill & Mfg. Co.	29	Shepard, Sidney & Co.....	80	Walworth Mfg. Co.....	105
McGowan, J. H. & Co.....	33&91	Pennsylvania Mch. Co.....	49	Sherwood Mfg. Co.....	32	Wardlow, S. & C.....	16
McIlvain, Wm. & Sons.....	25	Peerless Mfg. Co.....	75	Shipley, A. B. & Son.....	67	Warren Elevator Mfg. Co.....	45
McKay, Jas. & Co.....	15	Perry, W. H. & Co.....	49	Shoenberger & Co.....	86	Washburn & Moen Mfg. Co.....	4
McKinney Mfg. Co.....	82	Perry & Whipple Co.....	85	Shultz Belting Co.....	1	Waterbury Brass Co.....	2
McLean, John.....	27	Philadelphia Drop Forge Co.....	23	Sickels, Sweet & Lyon.....	67	Waterbury Farrel Foundry & Ma-	
McLeod & Henry Co.....	23	Philadelphia Engineering Wks.....	25	Sidney Steel Scraper Co .....	93	chine Co.....	33
McNab & Harlin Mfg. Co.....	27	Philadelphia Lawn Mower Co.....	97	Sigourney Tool Co.....	41	Waterbury Machine Co.....	13
Machinists' Supply Co.....	50	Phillips, Townsend & Co.....	12	"Silver Finish".....	13	Watson & Stillman.....	40
Mackey, James T.....	2	Phoenix Horseshoe Co.....	37	Silver Mfg. Co.....	74	Wayne, Anthony Mfg. Co.....	80
Mahoning Valley Iron Co.....	20	Phoenix Iron Co.....	14	Simonds Mfg. Co.....	62	Webster, Allen & Co.....	28
Main Belting Co.....	35	Phosphor Bronze Smelting Co.....	3	Singer, Nimick & Co.....	19	Weillman Iron & Steel Co.....	14
Manning, Maxwell & Moore .....	14	Pierce, Geo. N. & Co.....	71	Smith & Egge Mfg. Co.....	45	Wells Bros. & Co.....	43
Manville Machine Co., E. J.....	48	Pierson & Co .....	17	Smith, H. D. & Co.....	89	Western Foundry Co.....	23
Mansfield, H. H.....	50	Pike Mfg. Co.....	66	Smith, J. D. Foundry Supply Co.....	22	Wetherell Bros.....	16 & 19
Maris & Beekley.....	47	Pilling & Crane.....	15	Smythe, S. R. Co., Inc.....	28	Wetherill, Robt. & Co.....	105
Maslin, J. & Son.....	33	Piqua Mfg. Co.....	55	Solomon, Jno. M.....	22	White, A. A. & Co.....	62
Mast, Foss & Co.....	96	Pittsburgh I. & S. Eng. Co.....	25	Sommer's Son, John .....	106	White, L. & I. J. Co.....	67
Matthiessen & Hegeler Zinc Co.....	2	Pittsburgh Mfg. Co .....	34	Southwark Foundry & Machine Co.	28	White Mt. Freezer Co.....	67
Maurer, H. & Son .....	23	Pittsburgh Reduction Co.....	56	Specialty Mfg. Co .....	55	White, Van Glahn & Co.....	66
Mayhew, H. H. Co.....	61	Place, Geo.....	49	Speidel, J. G.....	47	Whitlock, Wm.....	43
Merrill Bros.....	23	Plumb, Fayette R.....	69	Spencer's I. S. Sons.....	23	Whitlock Coll Pipe Co.....	30
Merrill Mfg. Co.....	40	Plyme & Atwood Mfg. Co.....	2	Standard Fdry. & Mfg. Co .....	20	Whitney, A. R. & Co.....	17
Merriman, A. H.....	32	Pollock, W. B. & Co.....	27	Standard Horse Shoe Co.....	87	Whitton, D. E. Mch. Co.....	42
Meyers, F. J. Mfg. Co.....	79	Poole, Robt. & Son Co.....	51	Standard Tool Co .....	44	Wickes Bros.....	51
Miles, F. S.....	9	Pope Mfg. Co.....	57	Stanley Rule & Level Co .....	105	Wickwire Bros.....	7
Miller & Van Winkle.....	4	Popping, J.....	37	Stanley Works.....	84	Wilcox & Howe Co.....	85
Millers Falls Co.....	58 & 100	Port Chester Bolt & Nut Co.....	97	Star Mfg. Co.....	91	Wiley & Russell Mfg. Co .....	41 & 106
Milne, A. & Co.....	17	Porter, H. K.....	96	Stark Mch. & Tool Co .....	38	Williams, J. H. & Co.....	90
Milton Mfg. Co.....	97	Portland Lawn Sprinkler Co .....	93	Starrett, L. S.....	61	Wilkinson, A. J. & Co.....	61
Miner & Peck Mfg. Co.....	39	Pottstown Iron Co.....	17	Steam Gauge & Lantern Co.....	77	Williamson, C. T. Wire Nov. Co.....	105
Missouri Metal Co.....	2	Pottsville Iron & Steel Co.....	14	Stearns, E. C. & Co .....	56 & 84	Williamsport Wire Repe Co.....	6
Mohr, J. J.....	15	Powell Planer Co.....	50	Steptoe, J. & Co .....	60	Wilmot & Hobbs Mfg. Co .....	1&106
Monarch Cycle Co.....	73	Pratt & Cady Co.....	106	Sterling Cycle Works.....	72	Wilson, E. H. & Co.....	17
Monce, S. G.....	81	Pratt & Whitney Co.....	43	Sterling Emery Wheel Co.....	54	Wilson, John.....	66
Monroe Refrigerator Co.....	75	Prentiss, Geo. W. & Co .....	9	Sternbergh, J. H. & Son .....	98	Wilson, J. Fred.....	98
Montour Iron & Steel Co.....	20	Prentiss Tool & Supply Co .....	49	Stevens Arms & Tool Co .....	64	Wilson, W. A.....	39
Moore, Dr. Gideon E.....	56	Prentiss Vise Co.....	60	Steward & Romaine Mfg. Co., Ltd..	97	Winslow, Sam'l. Skate Mfg. Co .....	71
Moore Mfg. & Foundry Co.....	47	Rand Drill Co.....	31	Stiles & Parker Press Co .....	36	Wise Goods Co.....	6
Moore & White Co.....	43	Randolph & Clowes .....	1	Stirling Co .....	30	Wister, Francis.....	15
Moorhead-McCleane Co.....	19	Reed, Wm. & Sons .....	105	Stocking, E. B.....	6	Wister, L. & R. & Co .....	20
Morgan Construction Co.....	4	Reece, Edw. F.....	42	Stokes Mfg. Co .....	72	Withington & Cooley Mfg. Co .....	94
Morgan Spring Co.....	4	Reeves, Paul S.....	106	Storm Mfg. Co .....	60	Wolcott & West.....	53
Morrison, Robert.....	29	Reeves Pulley Co.....	45	Stover Mfg. Co .....	84	Wolf, W. & L.....	36
Morse Twist Drill & Machine Co.....	44	Remington Arms Co.....	73	Tow Mfg. Co .....	79	Wolff, R. H. & Co. Ltd .....	5
Morse, Williams & Co.....	47	Reynolds & Co .....	10	Superior Steel Co .....	5	Wollensak, J. F .....	60, 62 & 85
Morton, Thos.....	90	Richardson, C. F. & Son .....	62	Supplee Hardware Co .....	95	Wood, Alan & Co .....	15
Moseley Iron Bridge & Roof Co.....	10	Reeves, T. C. & Son .....	105	Sweet Mfg. Co .....	94	Wood, R. D. & Co .....	22
Mount Carmel Bolt Co.....	105	Reeves, W. J. & Son .....	105	Sweetser, W. A .....	20	Wood, W. Dewees Co .....	19
Myers, F. E. & Bro.....	60	Ridgeway, Craig & Son .....	48	Swindell, W. & Bros .....	26	Woodward & Rogers .....	39
National Horse Nail Co.....	89	Ridgway, Craig & Son .....	106	Taylor & Co .....	54	Worcester Mch. Screw Co .....	98
National Pipe Bending Co.....	30	Ridgway, Craig & Son .....	45	Taft Mfg. Co .....	5	Worthington, Henry R .....	83
National Saw Co.....	62	Ridgway, Craig & Son .....	73	Supplee Hardware Co .....	95	Wright & Colton Wire Cloth Co .....	8
National Wringer Co .....	77	Ridgway, Craig & Son .....	10	Sweatt Mfg. Co .....	94	Wurster, F. W. & Co .....	106
Newark Machine Tool Works.....	50	Ridgway, Craig & Son .....	80	Sweetser, W. A .....	20	Wyman & Gordon .....	90
New Britain Hardware Mfg. Co.....	97	Ridgway, Craig & Son .....	105	Swindell, W. & Bros .....	26	Yale & Towne Mfg. Co .....	46&59
New Castle Wire Nail Co.....	12	Ridgway, Craig & Son .....	62	Taintor Mfg. Co .....	62	Zucker & Levett Chem. Co .....	32
New England Screw Co.....	10	Ridgway, Craig & Son .....	105	Tablet & Ticket Co .....	54		
New Haven Copper Co.....	2	Ridgway, Craig & Son .....	48				



**DIRECTIONS FOR USING  
WILLIAMSON'S NEW POWER CORK SCREWS.  
KEEP ON TURNING, DO NOT PULL.**

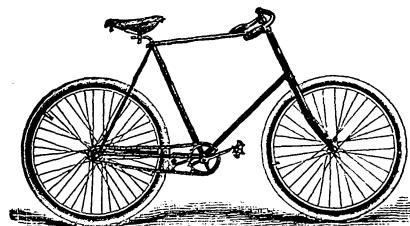
No. 1243, Nickel Plated, Apple Wood Handle, \$5.00 per dozen  
" 1443, " " Rosewood " 5.50 "

For Discounts and Prices of other styles send for Catalogue.

C. T. WILLIAMSON WIRE NOVELTY CO., NEWARK, N. J.

Manufacturers of Wire Specialties for the Trade.

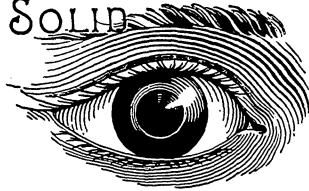
**OUR AGENTS MAKE MONEY.**



**FIRST AND ONLY  
IN THE WORLD TO MAKE**

**ALUMINUM RIMS AND CLINCHER TIRES.**

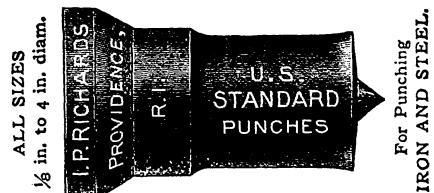
**SOLID** THE PRATT & CADY CO.,  
HARTFORD, CONN.



**Sash Weights.**

WILLIAM A. HARRIS, Selling Agent.

**The "DODD'S" LIQUID  
CLUE.**  
It gives Perfect Satisfaction.  
**Best.** A. W. DODD & CO., Gloucester, Mass.



**Mechanics.**—The Technical Student's Introduction to Mechanics. Being a series of Practical Papers showing the leading Principles of Physical Science, Exemplified in the Properties of Bodies or Materials; the laws which Regulate the Phenomena of Motion, of Heat, of the Atmosphere, of Water at Rest and in Motion, etc., etc., as applied to the Practical Work of the Architect and Builder, the Engineer and Machinist, and the General Artisan engaged in the Designing and Construction of Machines, Tools, and Appliances Useful in the Industrial Arts. By Various Writers. Edited by Robert Scott Burn. About 150 Illustrations, \$2.00  
For sale by David Williams, 96-102 Reade St., N. Y.

**BOOKS.** YOU CAN OBTAIN PROMPTLY the latest work on any subject in which you are interested by addressing DAVID WILLIAMS, Publisher and bookseller, 96-102 Reade St., New York



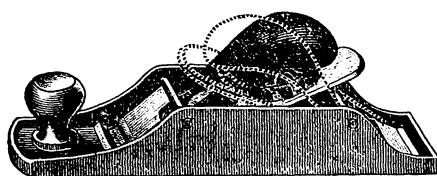
**IMPROVED  
Labor-Saving  
CARPENTERS'  
TOOLS.**

**STANLEY  
RULE & LEVEL CO.**

New Britain, Conn.

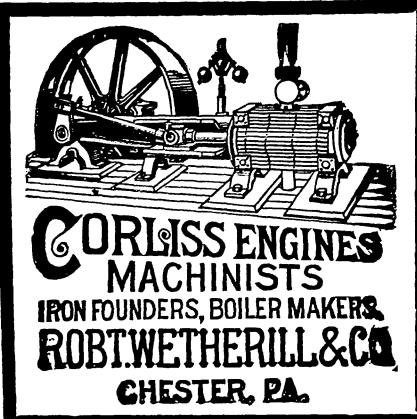
SOLD BY ALL  
Hardware Dealers.

**Double-Ender Block Plane**



This Plane has two slots, and two cutter seats. It can be used as a Block Plane; or, by reversing the position of the cutter and the clamping wedge (see dotted lines in the engraving), it can be used to plane close up into corners, or places difficult to reach with any other plane.

No. 180. Block Plane (Double-Ender), 1 1/4 inch Cutter, \$0.80



**Look! Look!!**

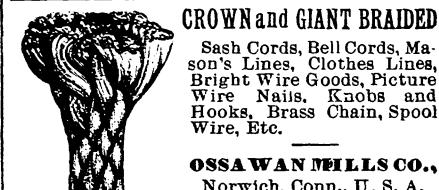
1894 MODEL BICYCLES  
FOR HARDWARE TRADE.



New 1894 Model NEW MAIL. Highest Grade, 10 years' reputation. Also BEST LINE cheap and medium grade wheels in the market. Address

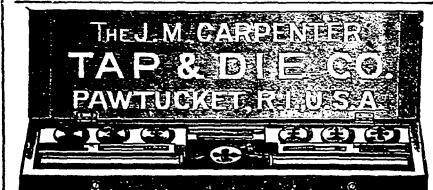
**WM. READ & SONS,  
107 WASHINGTON ST., BOSTON.**  
ESTABLISHED 1826.

**MUST SECURE AGENCY NOW!!!**



**CROWN and GIANT BRAIDED  
Sash Cords, Bell Cords, Mason's Lines, Clothes Lines, Bright Wire Goods, Picture Wire Nails, Knobs and Hooks, Brass Chain, Spool Wire, Etc.**

**OSSAWAWAN MILLS CO.,  
Norwich, Conn., U. S. A.**



**SECURE AGENCY NOW.  
The League Chainless Safety  
MARKS A NEW ERA.**



—SEND FOR CATALOGUE.—  
**THE LEAGUE CYCLE COMPANY,  
Hartford, Ct.**



This Out represents the UNION PAT. BOLT SNAP.

Hosted by Google

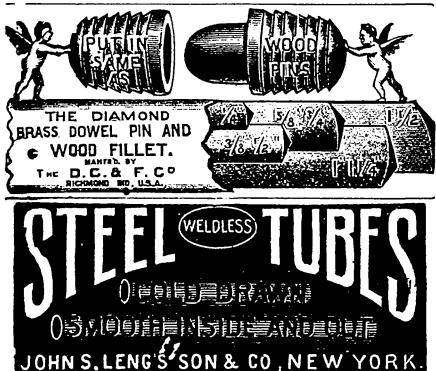
**PAUL S. REEVES,**  
Philadelphia.  
**Phosphor Bronze**  
AND  
**BABBITT METALS.**

Lead Lined Car Bearings a Specialty.

Brass and Phosphor Bronze Castings from  $\frac{1}{4}$  pound to 20,000 pounds in weight.



**NORWAY IRON RIVETS.**  
FOR ALL PURPOSES.  
WRITE FOR PRICES  
TO  
THE BOYCE RIVET CO.  
MUNCIE, INDIANA.



**DAYTON MALLEABLE IRON CO.**  
DAYTON, O.  
HIGH CLASS CASTINGS A SPECIALTY.

EXPERIMENTAL ELECTRICITY.  
By EDWARD TREVERT.  
Illustrated. - Cloth. - \$1.00.

CONTENTS—Some Easy Experiments in Electricity and Magnetism; How to Make Electric Batteries; A Galvanometer; An Induction Coil; An Electric Bell; A Magneto Machine; A Telegraph Instrument; An Electric Motor; A Dynamo; Electric Bell Fitting and Gas Lighting; Electric Lamps; Electric Terms.

Sent postpaid on receipt of price by  
**DAVID WILLIAMS**, Publisher & Bookseller,  
96-102 Reade Street, New York.

**STANLEY G. FLAGG & CO.**, Philadelphia, Pa.  
Office and Works, N. W. Cor. 19th St. & Pennsylvania Ave.  
Manufacturers of **STEEL CASTINGS**,  
A Substitute for Steel and Wrought Forgings.  
Circulars Sent on Application.

**ROLLER JACK SCREW.**

**See Page 58.**

**MILLERS FALLS CO.**,  
93 Reade St., New York.

**EUREKA CAST STEEL COMPANY.**  
Office and Works, Chester, Pa.  
Open Hearth, Crucible and Eureka Steel Castings.  
Railroad and Machine Castings.  
Locomotive Cross-Heads and Gearings a Specialty.  
Guaranteed Knuckles for M. C. B. Couplers.

**SPRINGS AND AXLES**  
ROLLING MILL.  
F. W. WURSTER & CO.  
375 Kent Ave. Brooklyn N.Y.

"Lightning" and "Green River"  
Pat. Adjustable Tap and Reamer Wrenches.  
Also Dies, Taps, Reamers, Screw Plates and other  
Fine Tools.

Manufactured by  
WILEY & RUSSELL MFG. CO., Greenfield, Mass.  
Send for new Catalogue.

**LIDGERWOOD HOISTING ENGINES.**  
300 styles and sizes. Over 10,000 in use.  
LIDGERWOOD MFG. CO., 96 Liberty St., N.Y.

ESTABLISHED  
Spring Making, 1842. Steel Making, 1845.  
Norway Iron, 1871 (Re-Rolled).

**WM. & HARVEY ROWLAND,**  
MANUFACTURERS OF  
Springs, Steel, Re-Rolled Norway  
Iron & Slit Norway Nail Rods.  
Address FRANKFORD P. O., PHILADELPHIA.

**A. G. PECK & CO.**  
Cohoes, N. Y.  
MANUFACTURERS OF  
AXES, ADZES,  
BROAD AXES,  
HATCHETS.  
Send for Catalogue  
and Price List.

**THIS IS THE TIME TO BUY**  
**Lemon Squeezers**

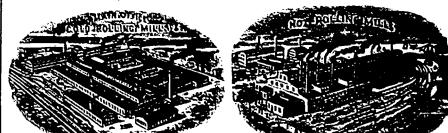
WRITE FOR PRICES TO  
**JOHN SOMMER'S SON**  
355-365 Central Ave., Newark, N.J.

**RUSSELL, BURDSALL & WARD,**  
Portchester, N. Y.,  
Manufacturers of  
Carriage, Tire, Plow and Stove

**BOLTS**

Carriage Bolts made from Best Square Iron a Specialty.

**The Wilmot & Hobbs Mfg. Co.,**  
MAIN OFFICE, MILLS AND FACTORIES AT  
BRIDGEPORT, CONN.  
STORE, 20 MURRAY ST., NEW YORK.  
(CONNECTED BY TELEPHONE.)



Annual Capacity 15,000 tons. Annual Capacity 30,000 tons.

**BESSEMER, OPEN HEARTH,**  
and the Celebrated and Unequalled  
"SWEDOH"

(REGISTERED TRADE-MARK.)

**Sheet, Band and Strip Steel**

**HOT ROLLED** in lots of a few tons  
in widths varying from  
one inch to eight inches or thereabouts by about 1-16  
inch and in thickness No. 21 Stubb's Gauge (about  
1-32 inch) and thicker for the narrower widths and  
proportionally thin for the wider sizes, and with  
plain blue, annealed or pickled finishes.

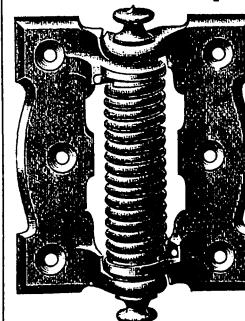
**COLD ROLLED** Especially to order  
in lots of a ton or  
more of a size, with  
round edges in any of the regular Hot Rolled Steel  
stock widths up to 15 inches (other widths  
furnished at our option with round edges or one or two  
sheared edges; unless ordered differently), and  
in thickness No. 33 Stubb's Gauge (less than 1-100  
inch) and thicker, depending upon the width, up to  
about No. 6 Stubb's Gauge (about 2-10 inch) and  
with any quality of surface or degree of  
stiffness or ductility, as follows:

**Tabulated Code** of Initials used in describing  
degree of Smoothness of Surface and Ductility of  
Cold Rolled Steel.

For more complete description of any one of these qualities of finish send for our new Steel Description Pamphlet.	"EXTRA SOFT BRIGHT DRAWING STEEL."	"SOFT BRIGHT DRAWING STEEL."	"HALF HARD BRIGHT BENDING STEEL."	"HARD BRIGHT BENDING STEEL."	"EXTRA HARD BRIGHT STEEL."
"Fairly Smooth" Surface.	A. F.	B. F.	C. F.	D. F.	NONE MADE.
"Good Smooth" Surface.	A. G.	B. G.	C. G.	D. G.	E. G.
"Best Smooth" Surface.	A. B.	B. B.	C. B.	D. B.	E. B.

Used for all Pressed, Stamped and Drawn Work. Easily Brass, Copper or Nickel Plated, Tinned or Japanned.

**Columbia Spring Hinges**  
FOR  
Screen  
Doors.



Cast Iron,  
Japanned.

These Hinges are very simple in construction. They are packed flat, with the tension of the Springs adjusted, and are "ready for business" as soon as attached to the door.

Having no small or loose parts, they cannot get out of order.

They are reversible and can be used on either Right or Left Hand Doors.

No. 14, 3 x 2 $\frac{1}{2}$ , Japanned.  
1 Dozen pairs in a box.  $\frac{1}{4}$  Gross pairs in a case.  
THE CHEAPEST AND BEST SPRINGS IN THE MARKET. SEND FOR PRICES.

MANUFACTURED BY  
**VAN WAGONER & WILLIAMS HDW. CO.,**  
Cleveland, Ohio, and 14 Warren Street, New York.

# THE IRON AGE

THURSDAY, APRIL 19, 1894.

## New Type of Vertical Compound Engine.

A few days ago invitations were extended to engineers by the Ball & Wood Company of 15 Cortlandt street, New

pounds. In a pamphlet descriptive of the engine its chief characteristics are stated to be—maximum economy obtained by minimum clearance spaces and correct distribution of steam; moderately high rotative speed; close regulation; a cut off valve gear, giving rapid cut off and wide opening of parts

doubtedly obtained with some form or modification of the Corliss wrist plate motion and valves, and the smallest possible clearance is obtained by placing these valves in the cylinder heads. This arrangement has been adopted in the engine here illustrated. The automatic cut off is obtained by independ-

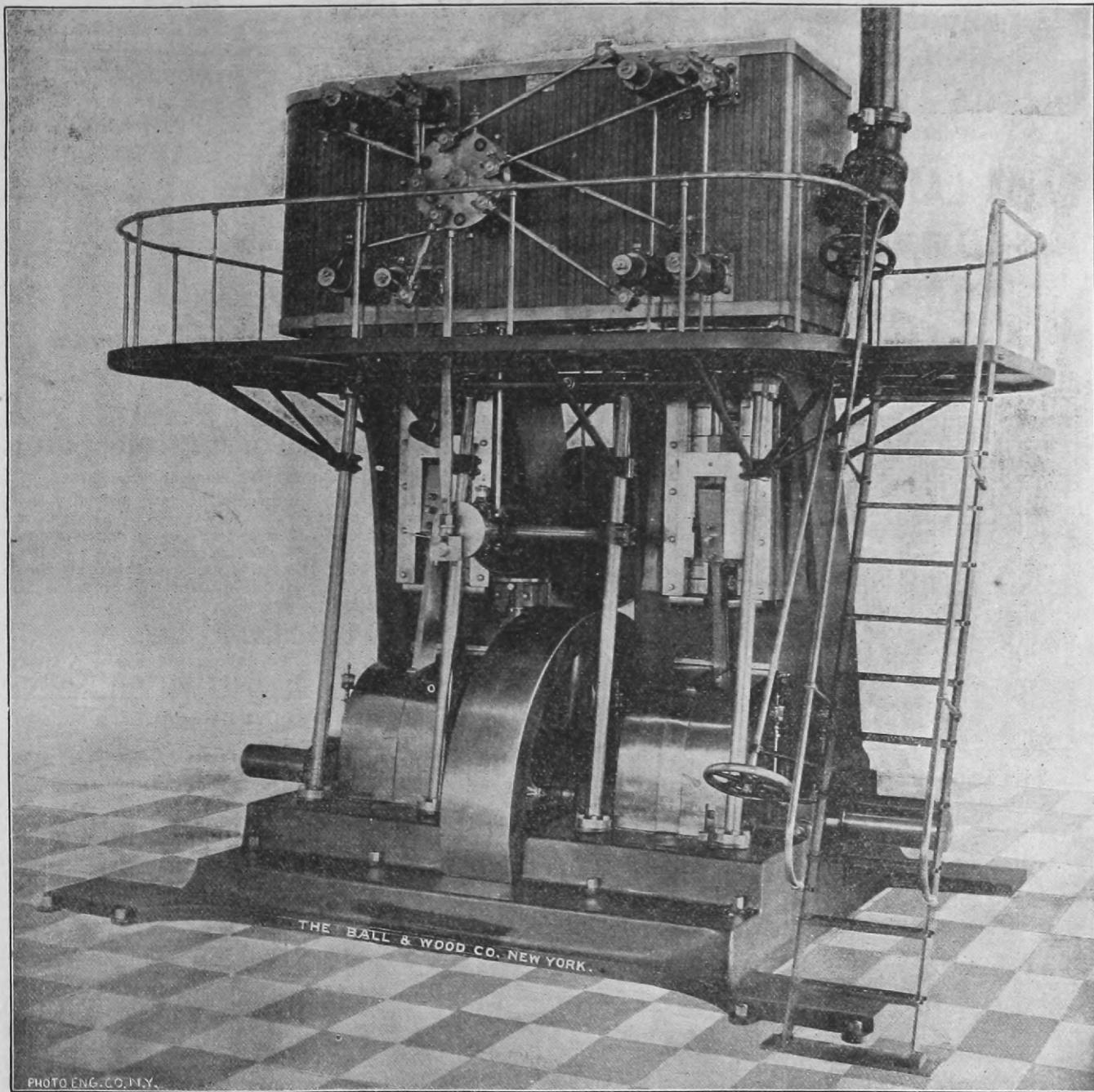


Fig. 1.—Front View.

### NEW TYPE OF VERTICAL COMPOUND ENGINE.

York, to visit their works at Elizabethport, N. J., and inspect a new type of vertical compound engine built by them. The engine is of 600 horse-power, non condensing cylinders, 19 x 31 inches, and stroke 24 inches. It is designed to run at 150 revolutions per minute, with an initial pressure of 125

at all points from zero to three quarter stroke; small floor space; special adaptation to driving direct connected dynamos, by reason of the shaft being entirely unencumbered with valve gear at both ends outside of the pillow blocks.

The best steam distribution is un-

ently operated cut off valves placed inside the steam valves, and actuated by a specially designed governor, as shown in the vertical sectional drawing, Fig. 3, through the cylinders and valves.

This arrangement places no restriction on rotative speed, which is decided by other considerations, and the aim has

been to find a medium unobjectionable to the slow speed advocates. The wrist plate connections with the exhaust and main admission valves are clearly shown in Figs. 1 and 2. The main valves admit steam constantly up to three-quarter stroke, the regulation being obtained by a cut off valve, operating in the main valve and controlled by the governor. The shaft carrying the wrist plate operating the admission and ex-

known Ball type. The attachment of the governor rod to the cross lever is at a point a short distance from the center line of the shaft and on the side opposite the rocker arm. The rocker arm, being rigidly mounted on the end of the shaft, has a constant and invariable travel. But the wrist plate, being loose on the shaft and being connected to the free end of the cross lever, has a variable travel as regulated by the governor.

cut off. The location of the valves in the cylinder head, giving as it does the shortest possible ports, permits of their being of ample capacity without an appreciable increase of clearance. The peculiar motion of the cut off valve utilizes these wide ports to the fullest possible extent, and the cut off motion at every point from zero to three-quarter stroke is a rapid one, in fact as rapid as is obtained from the releasing gear, be-

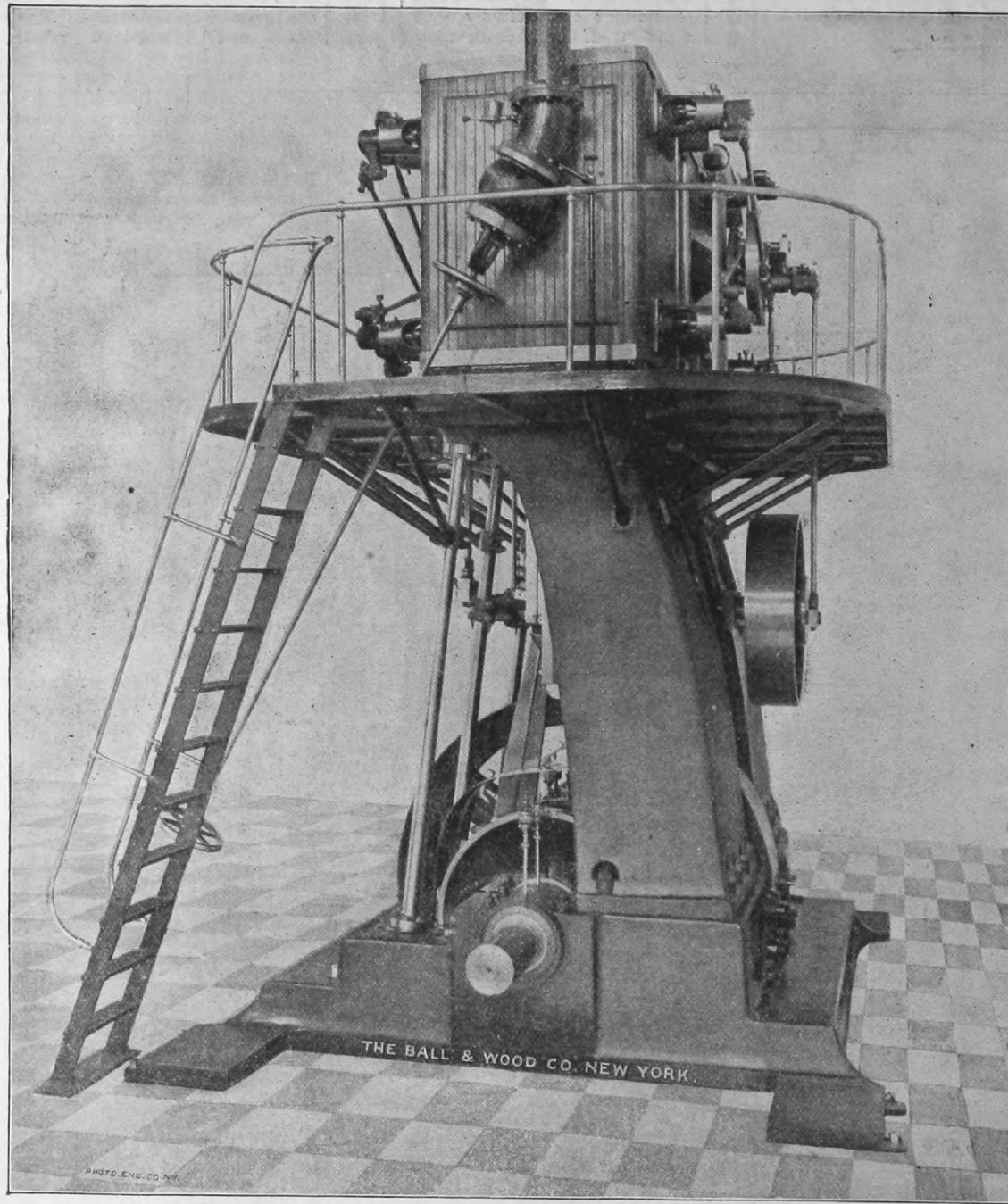


Fig. 2.—End View.

#### NEW TYPE OF VERTICAL COMPOUND ENGINE.

haust valves, Fig. 1, extends through to the other side of the engine, where it carries a rocker arm on its end. Back of the rocker arm is loosely mounted on the shaft a wrist plate, from which arms extend to the four cut off valves. To the outer end of the arm is pivoted one end of a lever, which extends across the shaft and has its opposite end connected by a link with the wrist plate. To this cross lever is attached the rod leading to the governor, which is of the well-

known Ball type. The attachment of the governor rod to the cross lever is at a point a short distance from the center line of the shaft and on the side opposite the rocker arm. The rocker arm, being rigidly mounted on the end of the shaft, has a constant and invariable travel. But the wrist plate, being loose on the shaft and being connected to the free end of the cross lever, has a variable travel as regulated by the governor.

cause of the higher rotative speed of the engine. Another feature of great importance with this gear, particularly with compound engines, or where moments of excessive overload occur, is its ability to cut off at three-quarter stroke, while the Corliss gear is limited to about half stroke.

The relief valve shown in detail in Fig. 4 is placed in each end of each cylinder. The spring which holds the valve to its seat provides for the release

of comparatively small pressures. The cylinder in which the relief valve is placed is closed by a plate in which is

pressure would result in the bursting of this plate, thus obviating all danger of damage to the cylinder heads.

they do not mark so wide a departure from usual practice as the valve gear, yet show the care and skill expended to make the machine perfect in every detail.

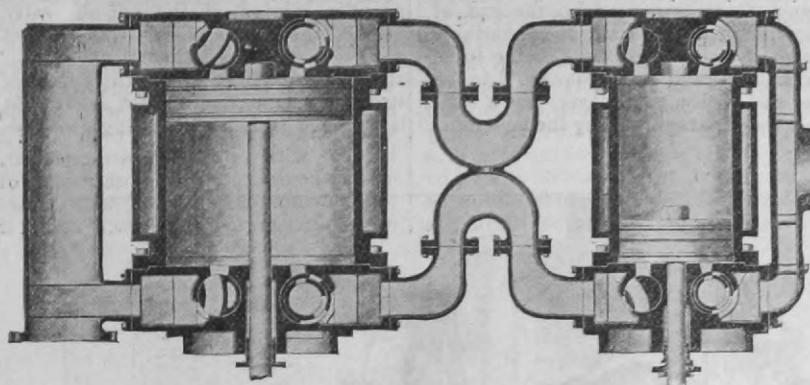


Fig. 3.—Vertical Section through Cylinders and Valves.

Very gratifying results as regards its uniformity and energy were obtained on Saturday, April 14, with the American Leonard smokeless powder. It was tested at the Naval Proving Grounds at Indian Head, in a 4-inch naval rapid fire gun, with a 33 pound projectile, in the presence of the chief of naval ordnance and a board of experts. A 5-pound charge of the powder yielded 1764 feet muzzle velocity with but 6 tons of chamber pressure per square inch; a 7-pound charge yielded 2054 feet muzzle velocity with 8 tons pressure; a 9 pound charge yielded 2299 feet velocity with  $9\frac{1}{2}$  tons pressure; an 11-pound charge gave 2537 feet velocity with 14 tons pressure; and a

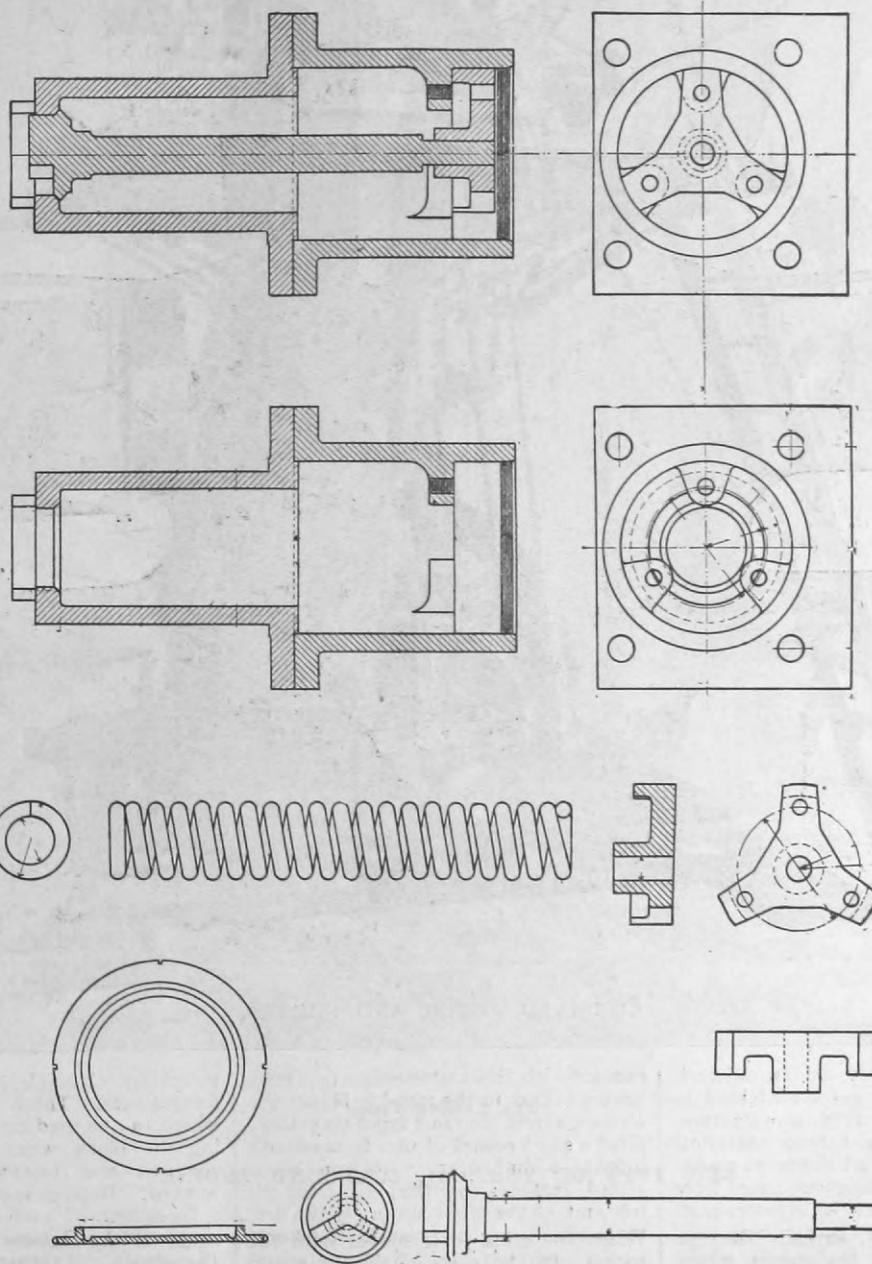


Fig. 4.—Details of Relief Valves.

## NEW TYPE OF VERTICAL COMPOUND ENGINE.

cut an annular groove to weaken it. An unusual accumulation of water in the cylinder and the creation of excessive

The engine in all parts is finished in the most perfect manner, and possesses other excellent features which, while

12-pound charge gave 2736 feet muzzle velocity with only  $17\frac{1}{10}$  tons of chamber pressure.

## Science in Steel Manufacture.

Among the interesting contributions to the metallurgy of steel the following extract from a letter of a producer of patented steel takes high rank. It is a good example of *fin de siècle* science:

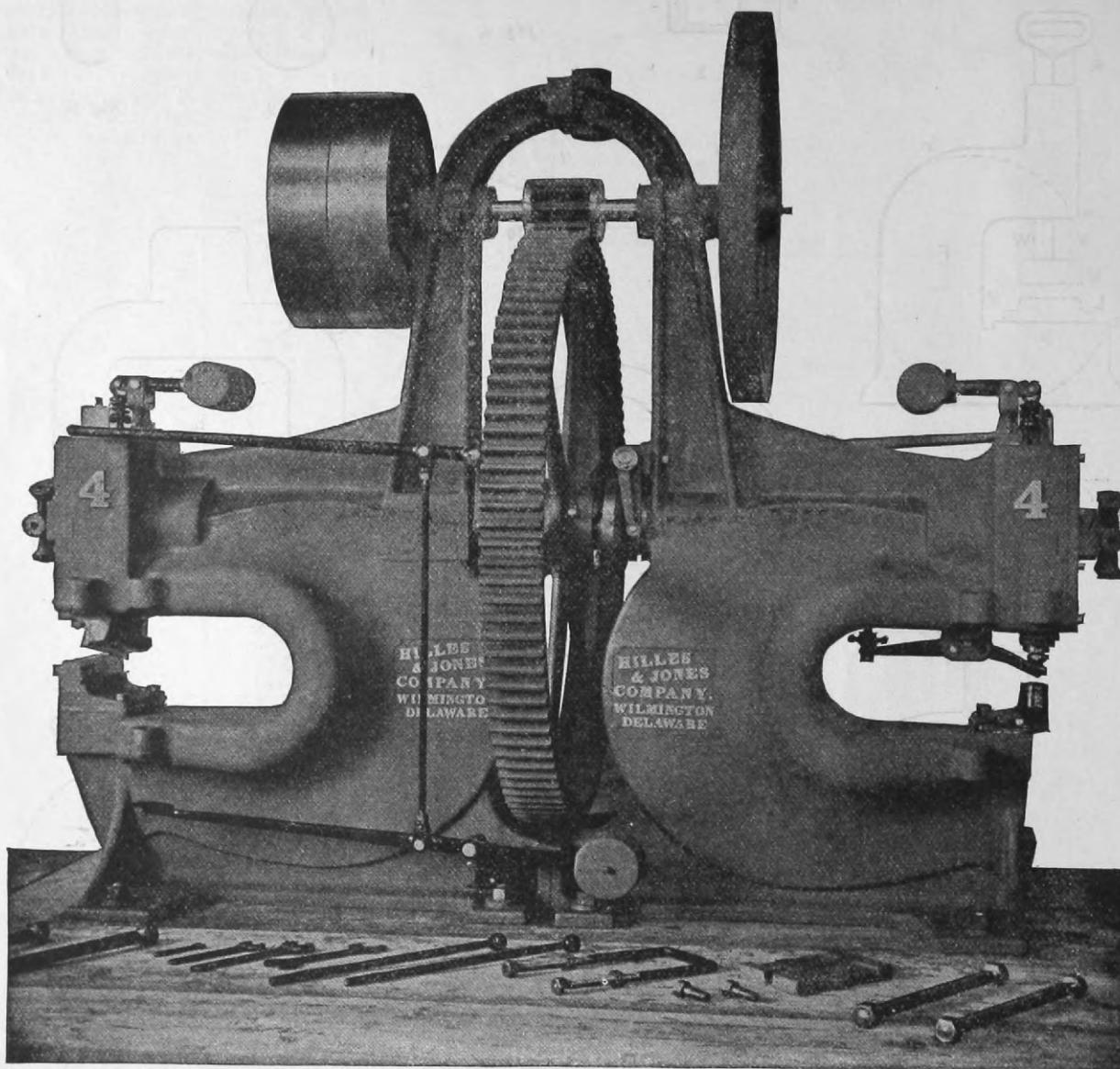
Wherein Blank steel differs from Bessemer and open hearth steels is in its metallurgical cohesion and physical properties: 1. Blank steel is a "true steel" that will harden and temper with a strong, tough, smooth cutting edge, as it is entirely separated from all the

Bessemer metal, high or low carbons, contains two or more grades of metal in every ingot, ranging from granulite, porous, seamy to segregate, occupying distinct zones in the ingot by reason of the extraneous mineralized scoria-cinder contained therein.

There is contained in much of Bessemer steel from  $\frac{1}{2}$  to  $1\frac{1}{2}$  per cent. of cinder that, in steel rails, makes itself manifest on the worn surface by way of brown specks from the size of a mustard seed to a grain of wheat, by reason of the sulphurous fumes from the smoke stack of the engine coming in

## Combined Punch and Shears.

A combined punch and shear has been designed for general work in either boiler or structural shops by the Hilles & Jones Company of Wilmington, Del. One end of the machine is fitted with knives for trimming plates. This end can also be arranged with knives and blanks for cutting off round or flat bars, or with a punching arrangement, as may be desired. The other side of the machine is arranged with a cast steel overhanging die block used for



COMBINED PUNCH AND SHEARS.

mineralized refractory oxides, deleterious substances and gases contained in stock, in the process of manufacture, by the use of an isomorphous catalytical flux that eliminates all the scoria-cinder and sets free the deleterious gases from the metal in the (steel) ladle before casting into ingots, thereby assuring uniform aggregation throughout the whole ingot.

Blank steel contains alum'num and chrome, and many other rare metals for special varieties of steel, which render it physically much stronger, more ductile, flexible, tenacious, anti-corrosive and reliable than Bessemer or open hearth carburets of iron—that is, it is up to a fine cast steel property basis.

Whereas, it is well known that all

contact with this extraneous oxide matter contained in the metal. Hence the four rails from the same ingot may show, after a short period of use, from smooth bright to dull gray, with iron black pitted surface; and the rail from the top end of the ingot is usually the first to break down, by reason of heterogeneity, porosity, side flaws or segregated ends.

There is more, but so much will do.

Taking effect on Saturday, April 14, freight rates on steel rails in carload lots of 12 gross tons and over from Bessemer, Pa., to Jersey City and Weehawken, N. J., will be \$2.40 per gross ton.

punching channels, I beams, angles, flanges, &c. There is a filling piece which can be used under the overhanging die block when preferred when channels and I-beams are not being worked. Both ends of the machine are independent of each other, both being controlled by clutches faced with steel. The depth of throat of the machine shown in the cut is 30 inches on each side. The weight is about 33,000 pounds. The proportions of gearing, arrangement of the metal to take the strain and all other points of detail have been carefully worked out. The sliding head is counterbalanced through a tension spring and has a taper brass shoe for taking up the wear.

## Press Working of Sheet Metals.—I.

BY OBERLIN SMITH.

### Introductory.

Of the origin and history of the art of metal work as performed in dies,

### Definition of Metal Working Press.

A general definition of the word "press," as used for the purposes with which we are concerned in this treatise, might be written as follows: A machine on which a bed or anvil is approached by a ram or hammer, having a reciprocating motion in a line approximately at right angles to said bed, and the

dies; a rigid frame work extending toward and surrounding the ram that it may slide, or sometimes swing, therein with a considerable degree of accuracy; means for taking up lost motion caused by original looseness of fitting or by subsequent wear; and a somewhat massive and rigid ram, carrying proper means for fastening and securely holding the other die. The surface of the

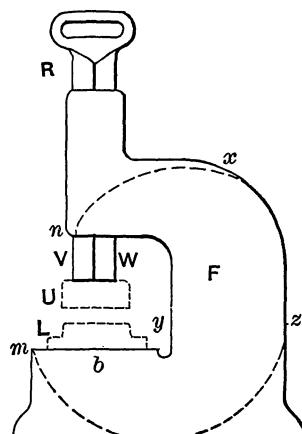


Fig. 1.



Fig. 3.

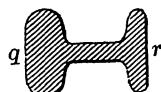


Fig. 4.



Fig. 5.

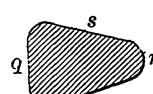


Fig. 6.

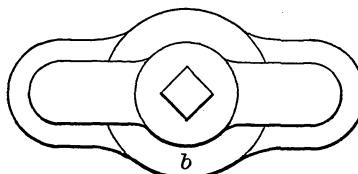


Fig. 8.

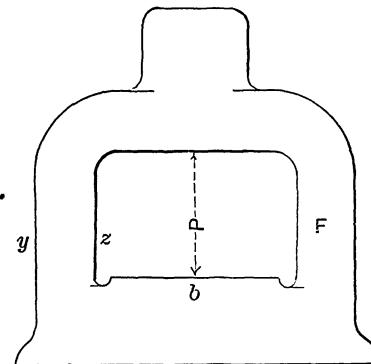


Fig. 7.

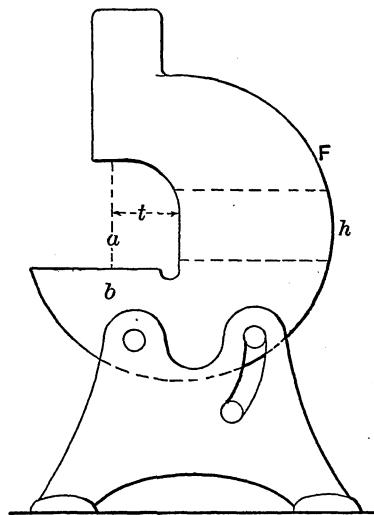


Fig. 11.

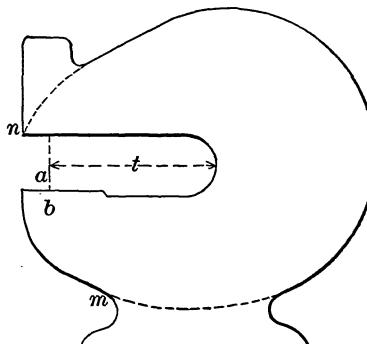


Fig. 13.

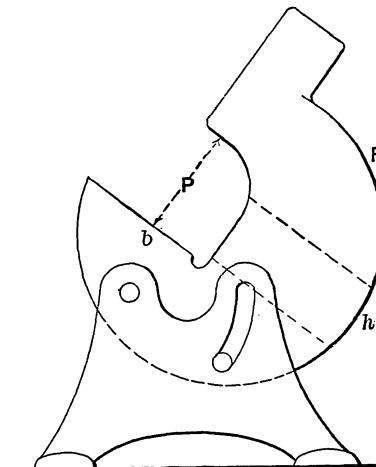


Fig. 12.

### PRESS WORKING OF SHEET METALS.

operated by presses, we know but little. The numberless wonderful and beautiful operations of to-day, most of which it must be acknowledged, however, tend rather to cheapening and unifying than to beautifying the articles produced, are merely the results of a long course of evolution, tending constantly to a survival of the fittest methods. Regarding the progress of the art as a whole, it cannot be said that any one age shines out upon the pages of history, or that any one inventor has made himself immortal.

said ram being suitably guided in the frame work of the machine that it may always move in the same path. It will thus be seen that the two important members in any ordinary press are the bed and the ram, and that they are only a more highly specialized form of the blacksmith's anvil and hammer or of the still more primitive large stone and small stone used by the predecessors of Tubal-Cain. The general essentials in such a machine are a massive and rigid bed with a flat and true surface upon which to fasten one of the

ram nearest the bed is usually flat and parallel thereto, although for some shearing work and occasionally for rough punching a ram is allowed to swing in the arc of a circle, usually being itself in such case a part of one arm of its operating lever. In the vast majority of cases, however, a ram is of cylindrical or prismatic form, sliding accurately in true bearings in the frame of the press. These bearings should, if the machine is of correct design, be of great length in proportion to the thickness of the ram, the object

of thus maintaining the ram rigidly in its predetermined path of motion being to always bring the dies together with the same relation to each other, that they may not be injured and that the work may be uniformly shaped thereby.

The causes which tend to destroy this accuracy of motion are: 1. The springing of the ram itself, when made too slim and when projecting too far out of its bearings. 2. False motions (sidewise) in its bearings, either by their not embracing it tight enough or

shown in the illustrations will be uniformly referred to by the following letters: F for press frame; b for the bed thereof, which is usually but not always a part of the same casting; R for ram; P for plunger; L for lower die; U for upper die; U' for drawing punch or inner upper die; M for matrix; K for knock out; S for stripper; G for gauge; p for pressure between ram and bed in the line of ram's axis; t for throat, and M for metal or other material to be worked in the dies. The other essential parts pertaining to presses and dies

#### Classification of Presses by Motion.

A strictly logical classification of presses seems impossible, as almost any given kind of press can be grouped by many different systems, some of which will inevitably interfere with and overlap each other. One important general distinction is that between single and double action—that is to say, between those having a plain ram with a simple uniform motion, and two rams one inside the other, with perhaps different amounts of motion and moving at dif-

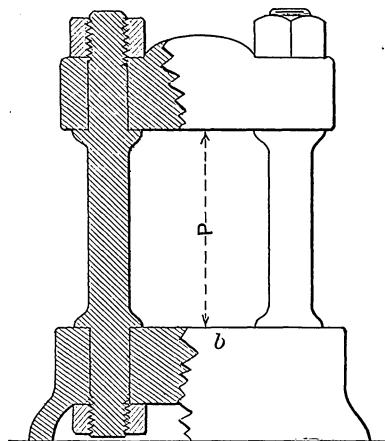


Fig. 14.

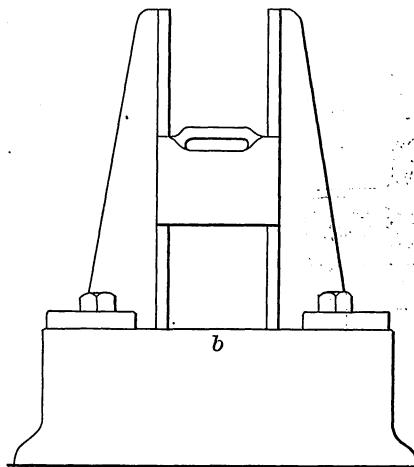


Fig. 22.

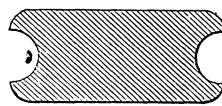


Fig. 20.

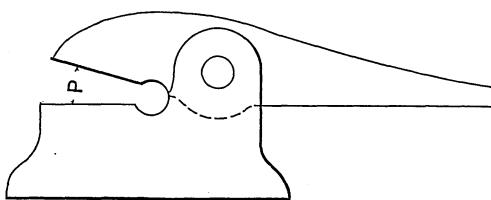


Fig. 23.

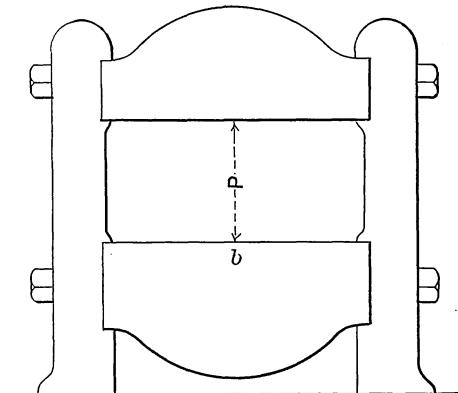


Fig. 21.

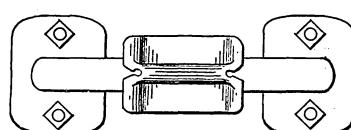


Fig. 24.

#### PRESS WORKING OF SHEET METALS.

by their being so short as to magnify by means of the leverage the slight looseness which is necessary in any working bearings. 3. The springing of the frame out of its normal shape at points between its bed and the ram bearings. It may therefore be said, in general, that it is almost impossible to make these parts of a press too clumsy, and that the more metal they contain, within reason and consistently with the space available, the better they are, especially as they want not only the strength to keep them in position, but all the inertia possible to prevent vibration when acted upon by the powerful and often rapidly applied forces necessary to move the ram.

Hereafter in this treatise certain parts

are so numerous that no definite system can be maintained in referring to them. The nomenclature herein used will follow conventional practice as far as is feasible, but in names with a number of synonyms the word which seems the most in accordance with common sense will be selected. A case in point is the ram of a press, which, called by this name, seems to be expressed in a short, crisp manner which almost explains itself (because of its ramming functions) even to a layman. Other names frequently used for this member are slide, slide bar, bar, mandrel, gate, head, plunger, &c. The last named word will be herein used for the inside ram of double action presses, the outside

one being called simply a ram. different times, as is the case with the ordinary drawing press. In some rare cases even more than two rams are used, but machines containing them may be justly ranked with special machinery, and need not be considered here.

#### Classification by Position.

Another conventional classification is by position. Whether a press is upright, as in Figs. 1 and 11, or inclined, as in Fig. 12, or horizontal, as would be the case if Fig. 1 was fastened with its base against a vertical wall, determined its position and perhaps one of its names. In Figs. 11 and 12 is shown a common form of press where the frame can be set at any desired angle between the two extremes shown by swinging,

rocking or otherwise revolving it, in relation to its legs. Such presses are usually called "inclinable," in distinction from the term "inclined," in which latter case the frame is supposed to be permanently fastened in such position. The object of this inclination is that work which is knocked up from the lower die, and delivered between it and the upper die, may slide away from said dies by the force of gravity, usually passing through a hole,  $h$ , indicated by the dotted lines, and thence descending into a proper receptacle.

#### Classification by Frame.

Another classification is by the kind of frame used, of which there are many types. The most common among these is the throated frame shown in side view in Figs. 1, 11, 12 and 13, where the throat measurement is counted from the axis  $a$  of the ram backward to the front surface of the frame, as at the dimension measurement  $t$ , and is usually expressed in inches. Such presses are usually cast with the frame in one piece. The general form is obviously that of a parabolic beam bent somewhat into the shape of the letter C. Such a beam, of course, has its ends of much less depth than its middle portion, according to the well-known laws governing the strength of beams when so constructed as to put equal stress upon the material at all points in their lengths. The ideal outside contour for such a beam is approximately shown by the dotted line in Figs. 1 and 13, which starts at  $m$  and ends at  $n$ . The parts of the frame exterior to this line are added at the bottom to give a flat base and at the top to give ram bearings, but the parts necessary for strength lie within said dotted line. In Figs. 3 and 4 are shown cross sections of the back part of the press frame cut at  $wx$  or at  $yz$ , where the tensile member  $q$  is connected with the compressive member  $r$  by two thin webs at the sides, or one web in the middle, as the case may be. Figs. 3 and 4 are equally good as regards the normal vertical strains of the press, but Fig. 3 has the well-known advantage of any tubular construction in regard to torsional strains, and is, therefore, better for a press frame, as there is less chance of the ram bearings springing sidewise. In both figures the member  $q$  is shown much heavier than the member  $r$ , because the usual material, cast iron, is supposed to be employed, and this metal has a tensile strength much less than its compressive. In Fig. 5 is shown a cross section sometimes used where there is evidently a considerable waste of material, both in the middle,  $s$ , and at the back,  $r$ . In Fig. 6 another section sometimes used is shown. The relation of  $q$  and  $r$  is correct, but there is waste material at  $s$ . In some cases press frames of the general C-shaped type in question are made with the projecting bed detachable, and perhaps adjustable up and down. Witness an ordinary horn press where the horn really constitutes the bed, but is interchangeable with other horns.

Perhaps the next most common form of press frame is shown in front view by Fig. 7 and in top view by Fig. 8, where the bed is connected to the ram bearings by two vertical posts or columns, forming a part of the same casting. In these figures a form often used for screw presses is shown, but the same general construction is more often embodied in much taller and narrower presses, which are frequently run by power and used for embossing, punching, &c., particularly in cases where

there is no need for passing through a wide sheet of metal, as is done in throated presses. In Fig. 13 is shown a common type of press frame with an exceptionally deep throat, which is used especially for heavy punching and shearing work.

It is evident that in Fig. 7 the frame  $F$  consists essentially of a double ended beam forming the bed, connected to another double ended beam across the top by the two upright columns, which are subjected to tensile strains mostly. Any shape of cross section is, therefore, suitable for columns of this kind, the most common forms being those shown in Figs. 9 and 10.

#### Composite Frames.

Besides the numerous family of seamless press frames there are a variety of composite constructions in which the frame proper is built up of several pieces. Among these a common form, which may be called a pillar press, is shown in partial front section in Fig. 14. In this case a heavy cross beam forming the bed, and usually also the base of the machine, is connected to the cross beam at the top by two or more cylindrical columns or pillars, which are usually turned and accurately fitted to bored holes in the aforementioned beams, being held securely therein by large nuts screwed on at the top and bottom ends thereof. This is a common construction in hydraulic presses, and also in ordinary power presses of very large size. No attempt has been made in the cut to show the ram or its driving mechanism. It will be noticed that the pillars of this press are subjected to tensile stresses only and that it is of a convenient form for cheaply making these members of forged metal, which, of course, makes them much safer against breakage. A design of this kind always strikes the observer as being more architectural in its nature than the forms previously described, as we have here some of the prominent elements of a Greek temple—the stylobate, the columns with base and capital and the entablature being clearly discernible. Its structural principle, however, is evidently very different from the temple in question, the stresses upon whose columns are purely compressive.

Another composite form of press frame is shown in Fig. 21, where the columns are usually of cast metal and where the cross beams forming the bed and what, for want of a better name, we will call the head, are notched into the columns and secured therein by heavy bolts from the outside. The stresses upon these columns are largely tensile, but strongly approach lateral stresses at the points of junction with the cross members.

Still another form of frame is shown in Figs. 22 and 24, where the portraits in front and partial top views, respectively, are of a somewhat corpulent member of the genus drop press, the ram being shown half way up, but without its lifting devices. Such a method of fastening the columns to the bed is sometimes used in other than drop presses, but is not well calculated to resist tensile stresses. This feature is, however, of no importance in the case shown, where the ram falls by gravity and is not pushed downward from any part of the frame as an abutment. This same remark in regard to an upper frame not needing strength, except for ram guiding purposes when gravity actuates the ram, will, of course, also apply to such constructions as Figs. 1 and 7. In Fig. 23 is shown one of

the forms of swinging ram previously referred to. In this way are built the well-known lever or alligator shears used in rolling mills, &c. The same principle is obviously employed in ordinary scissors, belt punches and other such tools. In one sense the ram may be said to form the upper arm of the frame. Numerous other frame constructions might be described, but the instances given will cover the majority of those in commercial use.

#### An Open Letter on Profit Sharing.

The Association for the Promotion of Profit Sharing has issued the following letter. It is signed by Carroll D. Wright, Washington, president; Francis A. Walker, Boston, N. O. Nelson, S. Louis, vice-presidents; N. P. Gilman, Boston, secretary; R. Fulton Cutting, New York, Alfred Dolge, New York, R. R. Bowker, New York, Henry R. Towne, Stamford, Conn., George A. Chace, Fall River, Mass., directors:

In anticipation of a revival of business and the consequent reopening of many mills and factories, which now seems probable, we would invite your attention to the importance of introducing some form of profit sharing as a feature of your industrial relationships. The method of paying a dividend to the workman out of profits as they are realized annually has been approved by most of the economists of Europe and America as thoroughly practical, and advantageous to both the employer and the employed. We will mention a few characteristics which should commend it to your careful attention.

Profit sharing can be adopted by an employer without risk of loss, inasmuch as he assumes under it no obligations except such as are to be discharged from profits actually made. His prerogatives as manager and his rights as proprietor are not curtailed. Profit sharing would establish a more friendly relationship of common interest between working people and the employer. This would be the surest pledge of industrial peace and the firmest support in times of commercial distress.

The employee, responding to such an advance by the employer, can increase the quantity and improve the quality of the product under a deeper feeling of personal interest. By his diligence, care and economy, he can actually create an additional profit, which is to be used in supplementing regular wages. Profit sharing includes the payment of the best wages current, and promises a bonus beyond this, which, experience shows, the interested workman can invariably produce in good times.

Profit sharing as a principle may be applied in a large variety of ways, and it can be readily adapted to the great majority of productive and distributive enterprises. We invite applications for full information concerning the history and the results of the system as it is now in operation in many establishments, small and large, in Europe and the United States. The address of the secretary of our association is 25 Beacon street, Boston, Mass.

California farmers are becoming anxious for the wheat and barley crops on account of the prolonged drought. The deficiency in the average rainfall up to the present is reported as being from 5 to 10 inches in several sections of the State, and it is said that only copious rain can avert a failure.

### The Flather Taper Attachment for Lathes.

The accompanying cuts show the taper attachment for lathes built by Flather & Co. of Nashua, N. H. The first engraving shows the attachment in position on a lathe; Fig. 2 is a perspective view of the attachment; Fig. 3 is an end view showing the bracket, the graduated hand wheel for setting the degree of taper required and the bearing for the screw in the sliding block on the carriage; Fig. 4 shows the bevel gears connected with the guide bar and graduated hand wheel; Fig. 5 shows the end of the cross feed screw. Instead of the cross feed handle being keyed directly to the screw, it is keyed to the reduced outer end of the sleeve or quill, within which the forward end of the cross feed screw is free to slide forward and back, but must turn with the sleeve, because driven by a feather. The taper guide bar is mounted on brackets in the usual manner, and is counterbored through the top to admit the bolts that fasten it to the brackets, and which are tightened or loosened with a box wrench from the top. All adjustments are made by the graduated hand wheel, which adjusts the guide through the bevel gear, as shown in Figs. 2, 3 and 4. This hand wheel has also a graduated adjustable stop, by means of which any degree of taper can be set accurately and quickly from the front. All parts of the attachment are provided with means for taking up wear. This attachment will turn a straight and correct taper, either inside or outside, without any back lash. It will be noticed that all adjustments are made by the operator from the front of the lathe.

### The Card Index.

The card index, as first applied for the purpose of cataloging the books of a library, has been greatly amplified in its use until it has become almost indispensable in many lines of business and engineering. By its use the depositors in a bank, the policy holders in an insurance company or the real estate in the hands of an agent may be most simply yet most accurately catalogued in such form as to be immediately available to any one. It enables the engineer to properly file the information he possesses on various subjects or the draftsman to make the most comprehensive record of his drawings; while the superintendent or manager may retain for ready reference card index reports of stock, prices and sales, or daily memoranda of iron melted, lumber used, orders received and the like.

To one who has always clung to the book method of record keeping the great advantages of the card system of indexing must appeal very strongly when properly presented. Above all, the card index is elastic, there is no limit to its possible and likewise its practical working size. Nothing is more common in experience with the book system of indexing than to find that it must be extended beyond the limits of the book provided. As a consequence it becomes necessary on most occasions of its use to look in two or more books for the desired name, if such it be. Of course, there are certain conditions under which the proper book may always be known and it is only necessary to find therein the given name.

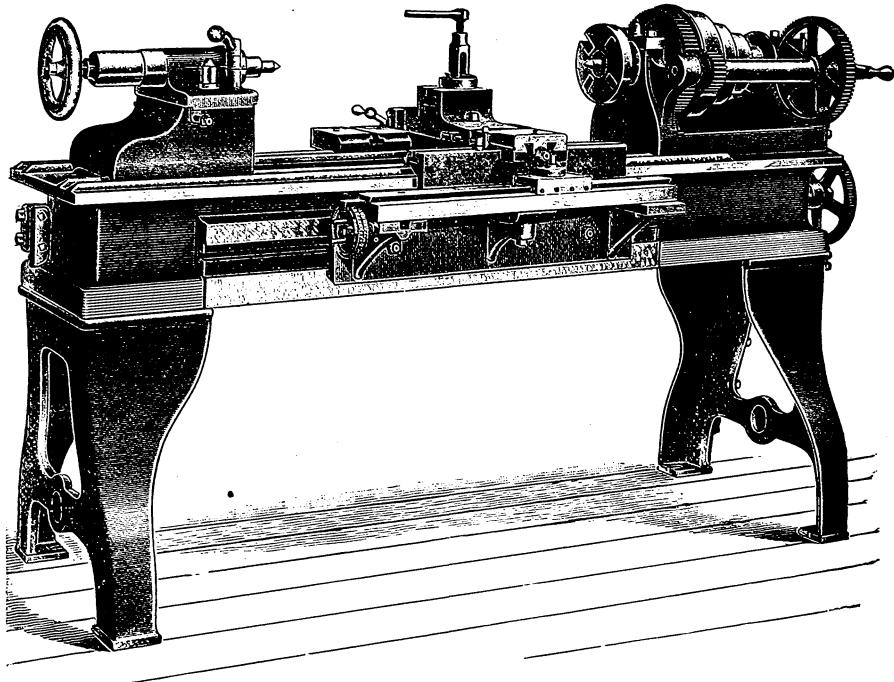
With the card index, however, in its

composite character, made up as it is by the proper arrangement of separate cards, there is always opportunity for extension by the mere insertion of any number of additional cards. It still remains a single index, and to a very considerable extent becomes more convenient for use as it increases in size, for then its separate divisions may be more distinctly marked. Even previously separate indexes (if you use the same sized cards) can be combined without the least inconvenience; something absolutely impossible with two book records.

Every card in an index has its own proper place, and once filed there can never be displaced by another. By subdivision under given headings any card index may become, for all practical purposes, a set of indexes; thus addresses, prices, orders, drawings and the like may all combine, each under its proper heading, to form one general index.

To avoid confusion and facilitate ready division by principal subjects sets of cards were printed with such headings as addresses, drawings received, engines, fans, heaters, orders and motors, said headings being in full faced Gothic letters in the upper left hand corners of the cards.

A certain method or principle was established for the form of this inscription upon these cards. In all cases the heading, if not already provided for in the printed cards, was to be printed with pen and ink, and thus smaller divisions were established. Then, as almost all the objects represented upon the drawings or covered by the orders were designated by size numbers, it was decreed that this designation should next appear on the line beneath the main heading and be followed by the necessary accompanying title, the drawing or order number and the date. Thus, to show how this might be carried out in detail, the card for drawing 6-387



THE FLATHER TAPER ATTACHMENT FOR LATHES.

The practical experience of a certain manufacturing establishment—the B. F. Sturtevant Company of Boston, Mass.—with this system of indexing may doubtless best serve to indicate the advantages of the method and the manner of making up and using the index. Although but few subjects were originally covered by the index under consideration, it now includes these main divisions: drawings, sub indexed also under address of purchaser when the drawing is for outside installation, and of address of party from whom received when drawing is made by outside party; orders, production lists, tabulated results of experiments, and incidentally with the drawings, an index to the patterns shown upon them.

The cards are of the usual form and style, 3 x 5 inches, specially ruled so as to give proper spaces for the inscription, and punched near the bottom of the long side to allow for the insertion of a small rod through a series of the cards, whereby they may be safely held in the drawer, and even locked there if desired. A set of drawers of the ordinary construction serves as a permanent receptacle for the cards as they require to be filed.

for the weight in a regulator used on a 10 x 12 horizontal automatic engine would appear thus:

#### ENGINES.

10 x 12 Horizontal Engine, Automatic Regulator. 6-387  
Weight.

January 15, 1894.

It will be noted that with the exception of the size or descriptive number, the record begins with the most general and ends with the most specific part of the title or description. Thus there may be a thousand engine drawings, half of these may be for upright and the remainder for horizontal engines, 50 of them may relate to the 10 x 12 horizontal engines, part to throttle and part to automatic engines of this size, and perhaps a dozen would cover the number of drawings showing regulators or parts thereof for this particular engine, while of these two may represent weights, but finally there is only one numbered 6-387, and consequently there is one place and one only where this card can be properly filed.

As each drawing representing a piece produced by the use of a pattern bears the number of that pattern, it is evident

that the drawing index is likewise, though less directly, an index of the pattern.

When the drawing is of such a character as to cause it to bear the address of an individual or business concern of any kind, or, in fact, whenever its title gives any indication of the future loca-

blowers have been built for use in the vessels of the United States Navy. As a rule these boats have been constructed by private individuals or corporations under various boat or hull numbers, and each vessel has subsequently been christened by the Navy Department with its own distinctive name. An ex-

made for the blowers Cruiser No. 12 was the distinctive title, and was consequently used in connection with the name of the contractors, Wm. Cramp & Sons, &c. Accordingly the first cards made out read thus:

ADDRESSES.

Cruiser No. 12, U.S.S.

followed in each case by the title, number and date of the drawing, the title here referred to being that descriptive of the blower, its size, hand, direction of discharge, &c. There was also filled out a card reading:

ADDRESSES.

Wm. Cramp & Sons Ship and Engine Building Company, Philadelphia, Pa.

Cruiser No. 12, U. S. S. See—

The location of the word "see" with relation to the rest of the inscription is partially indicative of its meaning, as may be thus explained. It is here intended to convey the idea that whatever relates to this particular boat as being built by Wm. Cramp & Sons will be found under the title Cruiser No. 12, U.S.S. If, however, it had preceded the reference it would have implied that all information regarding the subject at the top of card would be found under the title following the word "see." This application is made upon the card which follows, whereon it is shown that "Pirate" and Cruiser No. 12 are practically synonymous, thus:

ADDRESSES.

Pirate, U.S.S.

See Cruiser No. 12, U.S.S.

When the final and proper name of the boat was known another use of the word "see" was necessary, coupled with the word "also," as here shown, and indicating that part of the information might be found under Cruiser No. 12 and part under "Columbia," thus:

ADDRESSES.

Columbia, U.S.S.

See also Cruiser No. 12, U.S.S.

There was also introduced at the same time at the beginning of the division "cruiser" a card reading:

ADDRESSES.

Cruiser No. 12, U.S.S.

See also Columbia.

It must be evident from this somewhat extended explanation that a person knowing any one of the names here presented would, by finding it in the index, be led to the proper title under which the complete list of drawings could be found.

The methods are applied throughout the index of which the division "addresses" forms only a part. Explanatory cards are inserted wherever necessary, making the index complete within itself, so that a person unacquainted with its use can readily master it. For instance, failing to understand the distinction between the words "bed," "body" and "frame" as applied to a steam engine, he may turn to a card relating to each and find thereon the desired information.

Orders for production of given machines by the manufacturing department are indexed both by their numbers and by the titles of the machines, and therefrom may be learned not only the date of the order but the number of machines ordered and their distinctive shop number when completed.

Subdivision cards and guides are of the greatest benefit, indicating as they do very closely the exact location of a card, and collecting under sub-titles all cards relating to a given minute division of

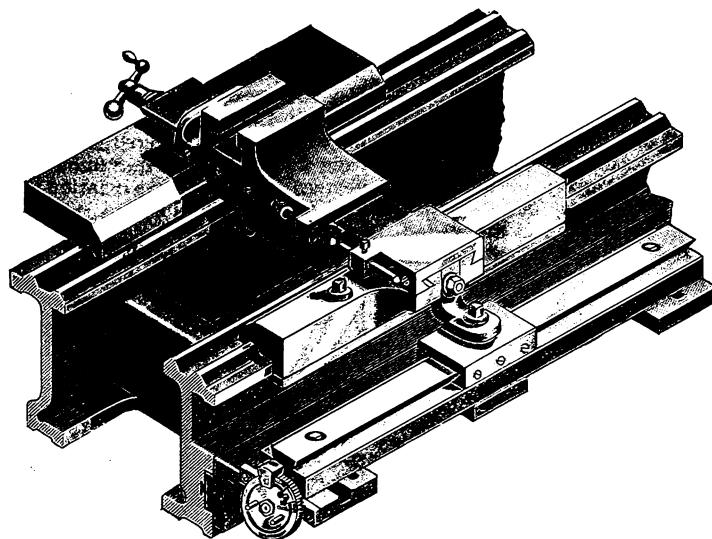


Fig. 2 —The Taper Attachment.

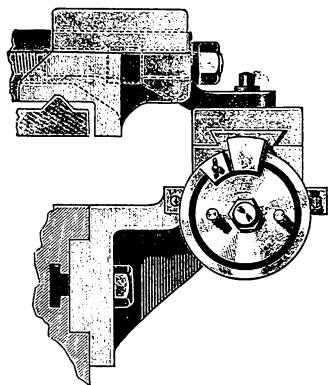


Fig. 3.—End View, Showing Bracket and Graduated Wheel.

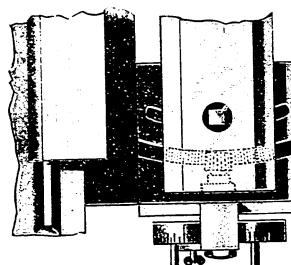


Fig. 4.—Plan View of Fig. 3.

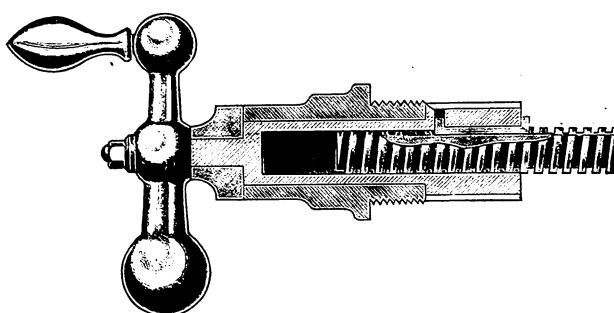


Fig. 5.—End of Cross Feed Screw.

#### THE FLATHER TAPER ATTACHMENT FOR LATHES

tion of the article, be it in ships, buildings or mines, a card record is made of the fact. In the case of an establishment like the one under consideration, where much of the work is built to special order to be permanently installed in some given place, it is of great importance to be able to readily find the drawings relating to the given plants or installations.

Thus, for instance, many special

gentle illustration of the general principle of cross indexing and of its remarkable convenience can be given by taking a practical though somewhat complicated case.

Cruiser No. 12, familiarly known as the "Pirate," previous to its launching, was built by the Wm. Cramp & Sons Ship and Engine Building Company, and subsequently christened the "Columbia." At the time the drawings were

the subject. Thus a comparatively small number of damper drawings are split under the main heading "dampers" into divisions indicated by cards reading "ash pit dampers," "flue dampers," and then the "flue dampers" are in turn further divided by cards reading "butterfly dampers," "key dampers," "mixing dampers," &c., while under each of these minor headings they are still further classified and indicated by their sizes and thus rendered accessible at a glance. Of course, it is understood that these division cards stand a little higher than the others, and have their titles upon this extended portion. Main divisions are separated by thin blocks of wood similarly inscribed.

The success of this one concern with this system is only indicative of its pos-

post cap is used in connection with wooden columns. In this case the plate has special recesses on both top and bottom sides to receive the lower and upper posts, while sufficiently strong brackets are cast to receive the girders on each side of the post. Instead of lag screws steel pins may be used to pass entirely through the beam and long enough to have a firm bearing in the recesses of the lugs. The manu-

Egyptian dynasties; but whether these served a telegraphic, telephonic or other purpose is not stated.

#### The Hawdon and Howson Blast Furnace.

Alexandre Pourcel, the well-known metallurgist, contributes to *Le Génie Civil* a series of notes on recent experimental work in iron and steel manufacture. In one of them he refers to the furnace built at the Newport works, in the Cleveland district, England, by William Hawdon and Richard Howson, giving the first sketch which has yet been published of the lines of the furnace. He reports that the furnace is now in blast, and that the advantages duly proved of this bold innovation are an increase in the production of 40 per cent. when compared with a furnace of like capacity built on the old lines. This increase has been obtained without running up the pressure of the blast and has led to a lowering of the fuel consumption by more than 100 pounds of coke per ton of iron, which grades between 2 and 3. Hawdon and Howson claim that the new lines avoid the drawback of the old, that the materials are most compressed when they reach the pasty condition. This brings about the difficulty experienced in getting the blast through a viscous mass often considerably agglomerated, which leads

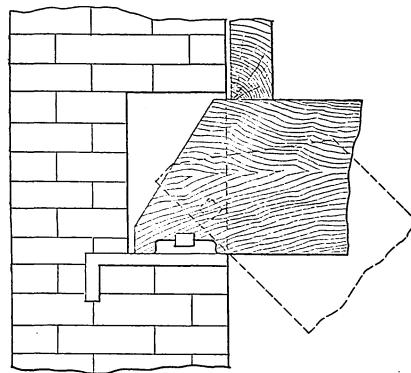


Fig. 1.—Section of Wall, Showing Joist and Anchor Plate in Position.

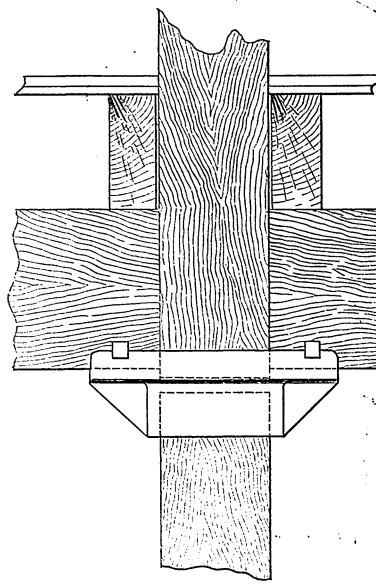


Fig. 2.—Post Cap Used in Connection with Wooden Columns.

#### EXCELSIOR ANCHOR PLATE AND POST CAP.

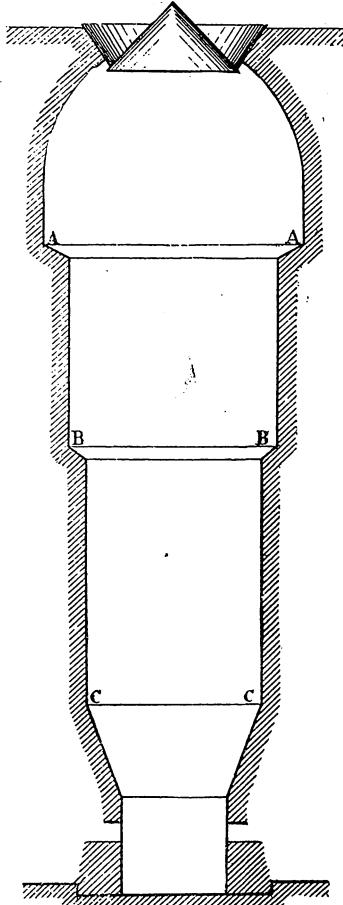
sibilities in other establishments. New divisions and new subjects are continually being added, and are emphatic evidence as to the convenience and efficiency of the methods employed. A small beginning may be easily and cheaply made by any one in order to test its merits, and there are few conditions under which it will not prove to be such a success as to warrant its further and more extended use.

#### Excelsior Anchor Plate and Post Cap.

The improved anchor plate and post cap which is illustrated in the accompanying cuts is being introduced to the trade by A. E. Krause, Columbia Iron Foundry, 55-59 Hudson street, Jersey City, N. J. The anchor plate is made with a recessed lug cast on its sides and extending upward, while a vertical rib on the back edge of the plate extends downward for the purpose of securing a firm hold on the brick work. A lag screw with a square head is then inserted into each side of the beam or girder, the projecting heads of the screws being made to exactly fit the recesses of the lugs. A clear idea of the construction may be obtained from an inspection of Fig. 1, which shows a section of floor joist with anchor plate in position. When the floor beams of a structure are burned through and fall, the ends projecting into the brick work are instantly released in such a way as to avoid serious injury to the walls. When the beams fall the lag screws release themselves from the lugs and the joist assumes the position indicated by the dotted lines. In Fig. 2 is shown the way in which a

facturer refers to the device as a positive anchorage and tie, the heads of the lag screws or pins exactly fitting the recesses of the cast iron lugs, thus bringing metal to metal and making it independent of any shrinkage of the timber, while leaving no chance for bad or careless workmanship. It is also referred to as being of such a nature as to save time and labor in setting. The arrangement of parts is also such that after the beams or girders are anchored by the Excelsior anchor plates, the work is not hidden from view, but can at all times be readily inspected. The Excelsior system of anchorage is also applicable to steel beams or girders, in which case the steel pins are passed through the flanges of the girders into recesses or openings in the anchor plate. The latter openings are somewhat elongated, so that in case of fire the proper allowance is made for the expansion of the girders to prevent their straining the walls outwardly, and at the same time are so adjusted that all slack is taken up when the girders are in their normal position. We understand that the Excelsior anchor plates have been used with gratifying results in a number of large buildings in various parts of the country and have been approved by prominent architects, builders and owners.

Verily, there is nothing new under the sun! It is reported that an English officer has discovered in India a working telephone between the two temples of Panj, about 1 mile apart. The system is said to have been in operation at Panj over 2000 years. In this connection the *Electrical World* observes that Egyptologists have found unmistakable evidence of wire communications between some of the temples of the earlier



The Hawdon and Howson Blast Furnace.

to scaffolds and in ordinary running to very slow reduction. M. Pourcel seems doubtful on the question of the danger of scaffolding through the sharp contraction of the lines at B C. In a footnote he adds that the furnace continues to do good work, making 700 tons a week, or 200 tons more than a furnace of the same capacity with the ordinary lines.

### The Garvin Eight-Spindle Automatic Drill.

This machine was originally designed for drilling the holes in bicycle chain links, but it can be adapted for drilling or counterboring a large variety of small articles where two or more holes are desired on opposite sides or ends. The spindle heads are mounted in pairs on the planed surface of an inclined frame, on which they are adjustable as to their center distances. Thus, the several pairs of spindles may be set so as to drill two holes in exact line from opposite sides of a piece, or parallel holes in each end of a link or piece at one operation. The spindles have automatic feed trip and reverse motion, and can be made to feed up to the work, one at a time, in pairs, all simultaneously, or in other combinations, as the work may require. They are driven by pulleys having a feather in the outer end of the hub, and running on independent hollow studs which take the pull of the belt, thus leaving the spindles free and

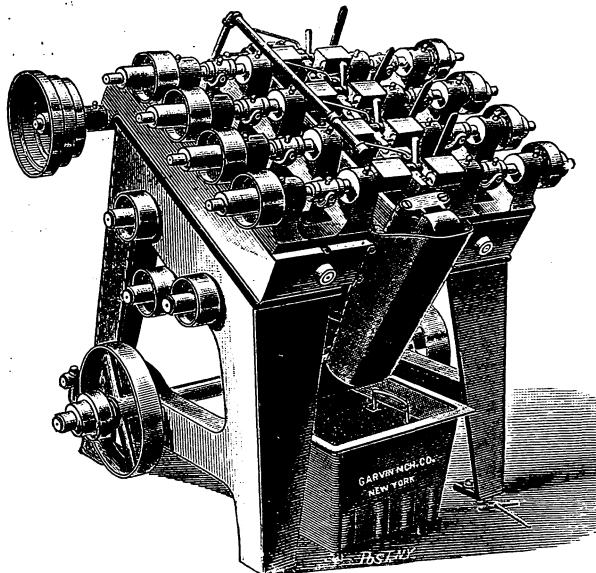
growing in importance; especially in the line of instruction to young mechanics. Altogether the work of the school year 1893-94 has been very satisfactory, with an enrollment of about 635 young men in 11 studies. The fall term begins October 3, and the committee of the institute are planning to add one or two new subjects to the curriculum for 1894-95. On April 30 and May 1, day and evening, there will be an exhibit at the headquarters of the institute, 222 and 224 Bowery, of drawings made by members of the freehand, mechanical, architectural and carriage drafting classes. The theory and practice of steam engineering and practical electricity are among the more popular and practical instructions given.

### The Link Belt Machinery Company.

One of the finest machine shops in the West is the Chicago plant of the Link Belt Machinery Company. It is located on the southeast corner of Stewart ave-

engine fly wheels of any face or diameter; shafting lathes and straighteners that will turn iron and steel shafting in 20-foot lengths up to 16 inches in diameter, the sizes being accurately gauged by approved micrometer gauges and guaranteed standard. Here, also, are hydraulic presses for placing couplings in position on shafts, gear cutters for wood and iron gears and pinions, drill presses, turret and gap lathes, pulley turning lathes of all sizes and punches and shears for iron work. Improved woodworking machinery is used in the millwright department and pattern shop, occupying the west gallery. This building attracts attention from those who pass it, owing to its peculiar construction. Although strongly built it appears to consist mainly of glass, the spaces between the windows being very narrow, making it look like a veritable crystal palace.

Adjoining the machine shop is the blacksmith shop, in which are eight forges and a steam hammer. Power is provided the machine shop and foundry by a battery of four boilers and an 18 x 42 Corliss engine. The power is transmitted by a system of manilla ropes and grooved sheaves. The foundry, which is also of brick and iron, 90 x 290 feet, is equipped with two Colliac cupolas having a melting capacity of over 50 tons of pig iron per day, pulley molding machines, large and improved core ovens, and every facility for prompt and efficient work. This building is further provided with a steam crane of 12 tons capacity, for handling heavy castings, while for lighter work numerous air hoists are distributed throughout the building. Flask sheds communicate directly with the foundry and the pattern storage vault, 40 x 90 feet, in which are stored patterns which represent a cost of over \$60,000, is near enough to facilitate the quick use and return of the largest patterns. The foundry and machine shop are connected by a narrow gauge track, by which castings requiring machine work are transported.



THE GARVIN EIGHT-SPINDLE AUTOMATIC DRILL.

sensitive. For each of the two sets of spindles, on opposite sides of the machine, there is an endless driving belt passing over idler pulleys, one of which is adjustable to provide for taking up the slack in the belt. The fixtures for holding the work are mounted between the spindle heads on a rail, beneath which is a cast iron trough for conducting the oil and chips to a tank beneath the machine, where the oil is strained and returned to the drills by an automatic pump. The weight is about 900 pounds, and with  $\frac{1}{16}$  inch drills it will turn out about 5000 pieces per day. The machine can be furnished in three ways: 1, As shown in the accompanying cut; 2, without the fixtures for holding the work, and 3, with heads on one side only, making a four spindle machine. The manufacturers are the Garvin Machine Company of Laight and Canal streets, New York City, who have given a great deal of attention to designing special bicycle machinery.

The ninth annual report of the Young Men's Institute, the Bowery Branch of the Young Men's Christian Association of New York, shows that the educational department of the work has been

nue and Thirty-ninth street and covers  $5\frac{1}{2}$  acres of ground. On the west side of it are the tracks of four trunk line railroads, with yard switches connecting the buildings with the main tracks of the Union Stock Yards & Transit Company on the south, which in turn connect with every railroad entering Chicago. The tracks extend in the buildings, enabling the cranes to be used in loading cars.

The main building, a substantial brick and iron structure, is 125 feet wide and 410 feet long, with galleries 40 feet wide extending the entire length, designed to carry heavy weights. This building has been constructed with a view to facilitating the rapid and economic handling of heavy work, and is equipped with a hydraulic crane on ways 40 feet above the main floor, having a capacity of 11 tons, a lateral traverse of 40 feet and available the entire length of the building. A space 370 x 40 feet is devoted to the erection of special machinery, which is subjected to a running test before shipment. In this building are over 125 power tools of the newest and most improved pattern and design; boring and turning mills capable of finishing pulleys; rope sheaves and

Paul Weiss of Arras, in his volume, "Le Cuivre," recently published by J. B. Baillière et Fils, Paris, describes and illustrates the results obtained by M. Guillemin by a microscopic investigation of copper and its alloys. He etches the polished surfaces and obtains characteristic figures, which indicate the structure. He states that it is possible to detect whether the alloys have been cast at the proper temperature, whether copper has been properly refined. He states that additions of phosphorus, aluminum or manganese produce characteristic figurings, and that the pressure of tin, lead or antimony may be readily recognized. The inquiries reveal whether the metal has been stamped or rolled hot, and with some alloys it is possible to recognize whether they have been hammered, rolled, or drawn hot or cold. It is claimed that with M. Guillemin's method users can determine what structure best serves their purposes, while producers are able to ascertain which processes they must adopt to attain them.

Over \$15,000,000 was spent in the relief of New York City's poor during the 12 months ended February 28 by 16 charitable associations, a sum at least \$5,000,000 larger than ever before expended for relief work. And yet only a portion of the total distress was reached and alleviated.

## THE WEEK.

The Central New Jersey Traction Company has been incorporated at Trenton, N. J., to carry out a scheme for connecting New York and Philadelphia by trolley. A supplementary charter is being obtained in Pennsylvania for a line from Philadelphia to Trenton. Construction of the trolley lines between Paterson and Orange and Trenton and Kingston is, it is stated, to be begun at an early date.

The Pennsylvania Railroad has, it is said, at last obtained an entrance into Detroit. The company have arranged to rent terminal facilities in that city from the Toledo, Ann Arbor & North Michigan Railroad.

The gold mining industry of Oregon received considerable stimulus last year. It is stated that the gold output for 1893 was nearly \$2,000,000, a far larger yield than ever before. Her wheat and woolen interests, however, suffered severely from depression.

Advices from Springfield, Mass., state that 300 of the new Krog-Jargensen rifles have been completed and are about to be sent to the War Department. Samples of the new gun have been sent to the Governors of the different States, and one of the new guns was sent on Tuesday to the German Emperor. Samples are also to be sent to the officers of the departments in the United States Army. The Fourth United States Infantry will be the first regiment equipped with the new piece.

Senatorial obstructionists at Washington would do well to ponder the methods of the Canadian Parliament in the dispatch of financial business. Canada's new tariff went into effect on March 27, a few hours after it had been brought down to the Assembly by the Minister of Finance. At 3 o'clock that afternoon all the telegraph lines were monopolized by the government, and by 8 a.m. the next day every custom house in the Dominion—some 800 in number—was in possession of the new tariff in full.

A decision affecting nearly every railroad in the country using steam heating in passenger cars was recently handed down by Judge Swan of the United States Court, at Detroit, against the Michigan Central Railroad. The decision sustains a patent granted to E. D. Cody in 1885, and owned by the Consolidated Car Heating Company of Albany, N. Y., on a system of car heating. It holds as an infringement the heating system known as the Martin apparatus, now used by the railroad referred to. The decree grants an injunction against the further use of such steam heaters.

A five-weeks' drought in England, France, Germany and other parts of Europe is causing much uneasiness to farmers.

According to the *Puget Sound Lumberman*, the output of lumber in the State of Washington for 1893 was of the value of \$10,700,000, in addition to \$2,636,000 of shingles. The figures in feet were: Lumber, 764,234,912; shingles, 1,829,528,500. This was greater than the output of Oregon, British Columbia, Montana and Northern Idaho combined.

Thomas Nevins & Son, contractors of Orange, N. J., have contracted to purchase the entire street surface railway

system of Detroit, Mich. The lines are 80 miles long, of which 30 are trolley lines. The purchasers intend to equip the system throughout with trolley lines as well as to extend it. This is one of the largest contracts in the history of electric roads.

The new wheat crop of the Argentine Republic is said to be an abundant one. It is expected that the surplus available for export will be largely in excess of the exportation last year, which amounted to over 1,000,000 tons. The wool clip is also said to be heavy.

The "St. Louis," the first steamship of the American Line to be built on this side of the Atlantic, will be ready for launching from Cramp's yards in July. Her sister vessel, the "St. Paul," will be placed in the water in the fall. Both vessels are expected to go into service next spring.

Clement A. Griscom, president of the American Steamship Line, describes the prospects for transatlantic cabin passenger traffic this year as being favorable for a better business than last year, although any large increase is not expected. The prospects for steerage business he thinks are not so satisfactory.

The recently enacted anti-monopoly law of the State of Illinois does not appear to operate satisfactorily, if it be true, as stated, that over 15,000 corporations in Illinois have neglected or refused to make a report to the Secretary of State, according to its provisions. About 10,000 only made full reports, while several thousands evaded the law by taking out certificates of dissolution. According to the law the Attorney-General is now bound to bring actions against the 15,000 delinquent concerns, a sufficiently arduous task.

What will be the largest dry dock in the world is now building at Southampton, England. It is to be 800 feet long, 110 feet wide, and will have 27 feet of water over the sill.

The firm stand taken by the Frick coke workers in declaring their intention to abide by the agreement with their employers has had much to do with the failure of the coke strike.

**Cast Iron Pipe Rates.** — A new table of rates on cast iron pipe from Chattanooga and the Birmingham district went into effect April 2 on the Queen & Crescent Route, the figure to some of the leading points being given below:

To	From	Chattanooga, Tenn.	Birmingham, Ala., district.
Buffalo, N. Y....		3.30	3.80
Chicago, Ill.....		3.10	3.35
Cincinnati, Ohio.....		1.75	2.25
Cleveland, Ohio.....		2.85	3.35
Columbus, Ohio.....		2.50	3.00
East St. Louis, Ill....		2.50	2.75
Indianapolis, Ind.....		2.70	2.95
Louisville, Ky.....		1.75	1.75
Milwaukee, Wis., all rail.		3.50	3.75
Milwaukee, Wis., rail and water.		3.35	3.60
St. Louis, Mo.,.....		2.50	2.75

The above rates apply to carload lots of 30,000 pounds.

The Supreme Court of the United States has affirmed the decision of the Circuit Court of Western Pennsylvania in the case of the Johnson Street Steel

Rail Company against William Wharton, Jr., & Co., Limited. The latter sued for royalties on a patent for a guard rail, and judgment for the sum of \$6306 was entered against the Johnson Company. The Wharton patent expired on June 4, 1889.

## The Otis Steel Company.

The sixth ordinary general meeting of the Otis Steel Company was held on March 30 at Winchester House, London. J. T. Smith, who presided, observed that the serious condition of the iron and steel trades in the United States during the last year must have been known to the shareholders, but it was only those who had had to conduct the affairs of this and similar concerns who could appreciate fully the difficulties which presented themselves. Although they were fairly busy in the early months of the year, their total production for 1893 had not been more than 65,000 tons of steel, a large proportion of which had been of a class which even in ordinary times only yielded a moderate profit. Referring to the reduced value of pig iron, &c., in stock, accounting for £24,000, he said that when they last met they entertained no idea that such a loss could happen, considering the prices at which they were taken in 1892. This did not by any means cover the loss in that direction, because they had been obliged to make contracts at current rates to be delivered *pari passu* with those existing while they were fulfilling, according to contract, the obligations entered into with those from whom they had purchased materials. A new system of management at the works had been inaugurated by Mr. Holland, one of the London directors, and already their returns were showing greatly improved results in the manufacturing departments. Some of them might have seen that, in the report issued by the committee of shareholders appointed to look into the affairs of the Trustees and Executors Corporation, certain observations were made respecting dealings which that corporation had in this company's shares at the time the prospectus was issued. This information had come as a matter of news to the board, who had known nothing of it. He then moved the adoption of the report, which was seconded by C. B. Holland. Mr. Squire, speaking as a member of the Iron and Steel Institute, said the works were well sold and badly bought. The Trustees Corporation had made £78,000 out of the transaction, and there could be no doubt that the concern was hugely over capitalized. Major Isaacs, who advocated the writing down of the capital, and other shareholders having spoken, the report was adopted unanimously.

A freight rate war now on between the Southern Pacific Company and the Atchison, Topeka & Santa Fé Railway Company is working to the benefit of Pittsburgh shippers. The Southern Pacific Company announced last week that, after April 12, freight rates from Pittsburgh to the Pacific Coast, by way of Cincinnati, New Orleans and the Sunset route, will be the same as from New York by way of the Morgan line of steamers to New Orleans and the Sunset route to the Pacific Coast. This is a cut of about one-half the rate on iron, glass and other products of Pittsburgh mills. The rates on other classes of freight are also materially reduced.

# The Iron Age

New York. Thursday, April 19, 1894.

DAVID WILLIAMS, - - PUBLISHER AND PROPRIETOR.  
CHAS. KIRCHHOFF, - - EDITOR.  
GEO. W. COPE, - - ASSOCIATE EDITOR, CHICAGO.  
RICHARD R. WILLIAMS, - HARDWARE EDITOR.  
JOHN S. KING, - - BUSINESS MANAGER.

## A Review of Iron and Steel Prices.

We have been requested by numerous readers to prepare a statement showing the extent of the decline in iron and steel prices at Chicago since the beginning of last year. The results of our investigations are given herewith, and we believe that all our readers will be interested in the facts which are presented. The period of time which is here covered was the most disastrous to business interests ever experienced in this country, except, perhaps, the months immediately following the panic of 1873, with which satisfactory comparison cannot be made for lack of sufficient data regarding the commercial disasters of that time. It will be well to recall that all prices were comparatively low at the beginning of 1893. Values had been steadily declining for over two years, and manufacturers were almost universally complaining of the unprofitable condition of their various industries. It was known that, at the then cost of materials and labor, many articles were selling at or below cost of production. Reasoning from experience, there was some ground for expecting a reaction toward better prices, and apparently little reason to anticipate a serious decline from the very low level then reached. But adverse influences, which it is unnecessary to dwell upon in this connection, carried the depression in business much further than had been anticipated or even feared, and the decline in prices since that time has been almost unparalleled. The fall in values which followed the panic of 1873 was in comparison but a gentle and very gradual reduction. Beginning with pig iron, the following table shows the course of prices during the period named:

	Local coke	Southern coke
	No. 2	No. 2
Jan., 1893	\$13.50 @ \$14.00	\$13.80 @ \$14.00
Apr., 1893	13.00 @ 13.25	13.00 @ 13.35
July, 1893	13.00 @ 13.25	12.75 @ 13.00
Oct., 1893	12.75 @ 13.00	12.35 @ 12.60
Jan., 1894	12.50 @ 12.75	11.90 @ 12.15
Apr., 1894	10.50 @ 11.00	10.00 @ 10.35
Ohio strong	L. S.	
soft No. 1.	charcoal.	
Jan., 1893	\$16.25 @ \$17.00	\$16.50 @ \$17.00
Apr., 1893	16.00 @ 16.50	16.50 @ 17.00
July, 1893	15.75 @ 16.25	16.00 @ 16.25
Oct., 1893	15.50 @ 16.00	16.00 @ 16.25
Jan., 1894	15.50 @ 16.00	15.50 @ 16.00
Apr., 1894	13.00 @ 14.00	15.00 @ 15.50

The April prices here quoted are the current rates and are not such prices as would be made on specially favorable contracts, although the figures named for Southern No. 2 are probably closer than those of the other kinds enumerated. The decline from

the low prices of January, 1893, was 26 per cent. for Southern, 22 per cent. for local coke, 20 per cent. for Ohio and 10 per cent. for charcoal. The comparatively light decline in charcoal pig may be ascribed to the fact that the makers have been unable to materially reduce their costs. Coming to finished iron and steel, the course of prices on mill shipments, Chicago delivery, for the same period has been as follows:

	Common bar iron.	Soft steel bars.		
	Cts.	Cts.	Cts.	Cts.
January, 1893	1.80	@ 1.85	1.70	@ 1.75
April, 1893	1.55	@ 1.57½	1.65	@ 1.70
July, 1893	1.45	@ 1.50	1.65	@ 1.70
October, 1893	1.42½	@ 1.47	1.55	@ 1.60
January, 1894	1.30	@ 1.35	1.30	@ 1.35
April, 1894	1.05	@ 1.15	1.15	@ 1.25

	Beams.	Tank steel.		
	Cts.	Cts.	Cts.	Cts.
January, 1893	2.17½	@ 2.25	2.00	@ 2.10
April, 1893	1.95	@ 2.05	1.85	@ 1.95
July, 1893	1.80	@ 1.90	1.75	@ 1.85
October, 1893	1.75	@ 1.90	1.75	@ 1.80
January, 1894	1.65	@ 1.75	1.55	@ 1.65
April, 1894	1.35	@ 1.40	1.35	@ 1.40

	Common sheet iron.		Galvanized sheet iron.	O. H. ma- chinery steel.	
	Cts.	Cts.	Discount per cent.	Cts.	Cts.
Jan., 1893	2.95	@ 3.00	70 and 7½	2.10	@ 2.20
Apr., 1893	2.80	@ 2.85	70 and 10	2.00	@ 2.20
July, 1893	2.80	@ 2.85	75 and 10	1.90	@ 2.00
Oct., 1893	2.80	@ 2.85	75	1.90	@ 2.00
Jan., 1894	2.65	@ 2.70	75 and 10	1.90	@ 2.00
Apr., 1894	2.25	@ 2.30	75 and 10 and 5	1.70	@ 1.80

The decline in the price of bar iron in this period was 34 per cent.; in soft steel bars, 32 per cent.; in beams, 38 per cent.; in tank steel, 32 per cent.; in common No. 27 sheet iron, 24 per cent.; in galvanized sheets, 23 per cent., and in smooth finished machinery steel, 15 per cent. The prices given for April do not represent the extreme bottom of the market in any case involving favorable specifications or particularly desirable quantities or deliveries. This is especially true with regard to beams, tank steel and sheets.

A striking point in connection with the decline in values during the past 15 months is the very heavy shrinkage since January 1 of the present year. Prices since then have given way with a rush. Manufacturers have been able to buy much cheaper ore and to make very low coke contracts; other materials have also fallen heavily, while labor has suffered a sharp reduction, and even freight rates have been greatly modified, resulting in a marked reduction of cost of manufacture, which has been applied almost entirely to the benefit of the consumer. This is a peculiar feature of the iron trade, in which it appears to differ radically from any other branch of manufacture. In no other industry does the buyer so promptly secure the benefit in his prices of a reduction in the cost of production. Buyers have been so thoroughly educated to expect this that they will not lay in any stock at even these unheard of rates, but will wait to see whether manufacturers cannot institute further economies and give their customers the benefit of still lower prices.

It is a curious fact, to which little attention has been given thus far, that for one very important class of structures tests of the material used are

very rarely made in behalf of the purchaser. We refer to the architectural iron work which is assuming such great proportions in our larger cities. So far as we know, specifications bearing on the steel or iron of which beams are made are of very rare occurrence. The majority of manufacturers issue books showing the safe loads which every particular section which they manufacture can carry. The user accepts these figures without any effort on his part to ascertain whether the quality of the material is such that he can depend upon its sustaining the load. Probably the very liberal factor of safety generally prescribed has prevented any troubles which would have brought the matter to the attention of the consumers. The great majority of American beam makers use first-class materials, but we do know of cases in which beams have suddenly broken, and know that in at least two instances the low quality of the material was due to gross carelessness in allowing the phosphorus to go above safe limits. We believe that the time will come when users of beams will demand guarantees as to quality of material very generally. It would probably be a wise step for progressive manufacturers to furnish to buyers of their own accord copies of the analytical and testing records which the majority of them collect as their checks in the ordinary course of manufacture.

## Finished Iron and Steel in Great Britain.

Now that the returns have been received from the British Iron Trade Association on the production of open hearth steel, comparisons are possible which possess some interest. The association aims to collect, so far as it is possible, some data showing the finished forms into which the material has gone. The returns are confessedly not complete, nor does the classification appear to be uniform or happy in some respects. But some general impressions may be obtained. The reports show a total of 1,225,786 tons of finished Bessemer steel, 1,216,287 tons of open hearth steel and 1,259,141 tons of puddled iron, a proportion which, of course, differs greatly from that in this country, where Bessemer steel plays a very much more important part, while our output of open hearth metal is much less.

Out of a total of 629,321 tons of rails 579,836 tons were made of Bessemer, and the only return of the product of sleepers, 31,716 tons, is of the same metal. Open hearth steel is the principal material for plates and angles in Great Britain, there being only 45,932 tons of Bessemer, against 536,775 tons of open hearth and 155,022 tons of puddled iron. Under the latter there is also specifically enumerated 43,064 tons of tees. Beams are not specially enumerated, although several concerns in Great Britain are now making them, disputing the monopoly which, curiously, Belgian and German makers

held for so many years in the English home markets. Bars and forgings, inclusive of tin plate bars, are enumerated to the extent of 296,843 tons under Bessemer steel, 230,850 tons under open hearth steel and 293,489 tons under puddled iron. Probably "rounds and squares," specially enumerated under the latter, may be properly classified with this group. Steel castings foot up to 37,260 tons, of which 33,511 tons were open hearth steel. Of the total of 75,469 tons of tires open hearth steel claims 61,051 tons.

It is quite impossible to judge to what extent the 206,994 tons of Bessemer and 211,640 tons of open hearth blooms and billets are duplicated in other returns or appear as finished material with iron. Nor is it hardly credible that the 186,892 tons of sheets, 100,321 tons of hoops, 61,868 tons of wire rods and 67,298 tons of skelp specially enumerated under puddled iron could justify the inference that in these lines no steel is used. It is impossible that the total production of wire rods in Great Britain is only 61,868 tons, or hardly more than one American Garrett mill can turn out in one year running on soft steel. It is a pity that the English statistics are so much less complete than those annually gathered by the American Iron and Steel Association. While there are one or two conspicuous instances in this country of concerns who have steadfastly declined to furnish complete statistics of production to our admirable body, it is quite evident that the antediluvian notion of secrecy prevails to a much greater extent in Great Britain.

The National Miners' Convention in session at Columbus, Ohio, last week decided that the wage scale and conditions adopted at the convention one year ago shall be demanded as the object of the strike to be inaugurated on April 21. This is the 70-cent per ton basis. It means an increase of from 20 to 25 per cent. per ton in wages now paid in Pennsylvania, Ohio, Indiana and Illinois. The date of the annual convention was changed from the second Tuesday in April to the second Tuesday in February. John Fahey of Ohio and T. A. Bradley of Pennsylvania were elected members of the National Executive Committee. The convention decided to publish the secret work of the order in the Slav language for the benefit of foreign miners in Pennsylvania. The convention referred to the executive board the question of changing district boundaries, and also the question of making a new district composed of Mercer, Beaver, Butler and Lawrence counties in Pennsylvania. The convention adopted unanimously a resolution to act in politics as a unit and independent of political parties. John McBride, P. A. McBryde, P. H. Penna and John Nugent were elected delegates to the American Federation of Labor, meeting at Denver next December. The proposition to remove the headquarters to Chicago was defeated. The so-called Socialistic system of local organization was adopted for the union in the Western States. M. Ratchford and John Call of Ohio were elected auditors. The convention then adjourned. The coal operators of the Pittsburgh district have

not as yet taken any steps to meet the action of the miners' convention at Columbus, Ohio, to strike on April 21. The decision to go on strike was no surprise to the operators, as they claim they have been expecting such a declaration for some time. The 800 miners employed at the Turtle Creek Mines of the New York & Cleveland Gas Coal Company last week refused a proposed reduction of 10 cents per ton. The beginning of the strike on the date decided upon will prevent the operators from opening the lake trade, which comprises the principal business in coal. It is this which causes the miners to look for a speedy agreement upon a uniform rate in the several districts.

## CORRESPONDENCE.

### Keep's Foundry Chemistry.

*To the Editor:* Noticing Mr. Keep's paper in *The Iron Age* on the 12th inst., I beg leave to say that the statements made are, as far as I can see, in substance the same as those made in his paper of February last, which statements received a very severe criticism at the meeting of the Foundrymen's Association in Philadelphia.

Mr. Keep's statements are, on the whole, inconsistent and contradictory, and it is useless to reply to them in detail any further, as it will only be a repetition of facts that have been threshed over and over. He has made such extensive use of chemical tests that he is now able to tell the founders—those that are making rough work only—that the composition of American irons can be overlooked except as regards the silicon contents, and though he has silicon determinations made for his own work, he advises others to purchase irons by fracture, at the same time admitting his own mistakes in transactions made on the latter basis. Does Mr. Keep expect American irons always to be of the same compositions as he has found them?

But it is of little avail to discuss the kind of foundry work, the success of which is claimed to depend even upon atmospheric conditions, and the manipulators of which seem determined to preserve it, to the edification of posterity, as the last remnant of the black arts.

Yours truly, Wm. MOLIN.

NEW YORK, April 12.

According to the final figures issued by the Director of the Mint Bureau at Washington, which, he asserts, are certainly not in excess of the actual facts, the gold production of the United States during the calendar year 1893 was 1,739,081 ounces, valued at \$35,950,000, an increase for the year of 73,455 ounces, representing \$1,739,081. The following list shows the production in fine ounces for the calendar year 1893 by States, with the increase or decrease as compared with 1892: Alaska, 48,863; decrease, 3403. Arizona, 57,286; increase, 321. California, 584,370; decrease, 28,796. Colorado, 364,022; increase, 96,072. Georgia, 4702; increase, 119. Idaho, 79,669; decrease, 3602. Michigan, 2032; decrease, 354. Montana, 172,941; increase, 29,433. Nevada, 46,367; decrease, 29,654. New Mexico, 44,171; decrease, 2229. North Carolina, 2593; decrease, 1207. Oregon, 79,543; increase, 7378. South Carolina, 5998; increase, 30. South Dakota, 193,761; increase, 3043. Utah, 41,293; increase, 9357. Washington, 10,744; decrease, 7327. All other States, 726.

## Washington News.

(From our Special Correspondent.)

WASHINGTON, D. C., April 17, 1894.

### The Tariff Situation.

The general debate, by common consent on both sides of the Senate, will terminate on next Monday, April 23. On that date the consideration of the bill by paragraphs and items under the schedule will commence and be continued indefinitely. This arrangement will have given three weeks to general discussion. The minority see no particular advantage in continuing speeches on generalities when there is such an endless fund of material to draw from which will more directly interest the people and their industries.

During the two weeks which have elapsed since the discussion commenced nine set speeches have been delivered by Senators Voorhees of Indiana, Allison of Iowa, Mills of Texas, Peffer of Kansas, Hill of New York, Lodge of Massachusetts, Hale of Maine, Mitchell of Oregon, and Quay of Pennsylvania. Upon these five hours have been devoted each day. There are 30 more speeches already on the list, but they will be delivered under the consideration by paragraphs.

There is no disposition to vary from the practice of the Senate allowing unlimited debate. As the items under the bill are practically without limit, and each one can also be debated without limit, it can be seen that the minority can embark in a limitless debate if they wish.

If the bill is not recommitted or killed by a vote, the debate will be carried into the elections for the Fifty-fourth Congress.

The speeches arranged for the immediate future are Smith of New Jersey, Morrill of Vermont, Turpie of Indiana, McLaren of Mississippi, Perkins of California, Higgins of Delaware, Hawley of Connecticut, Gallinger of New Hampshire, Cullom of Illinois, Dolph of Oregon, Frye of Maine, Palmer of Illinois, and Mills of Texas, at greater length than his first speech.

There is more interest manifested in the speech of Senator Smith of New Jersey than any of the above named, as he is known to be hostile to the bill in its present form; but the scope of his opposition is not known. Senator Hill's speech has brought him letters of approval from all parts of the country. The Senator informed the correspondent of *The Iron Age* that he would have more to say when the great industries of New York, which are menaced by the bill, are reached.

The passage of the Wilson Voorhees bill in any shape approximating its present form is now impracticable. If a vote were taken to-day it would stand:

Minority (Republicans).....	38
Senators Hill, Brice, Gorman, Smith, Murphy.....	5
Total.....	43

This would be a majority of a full Senate, there being three vacancies, one Senator each from Montana, Washington and Wyoming, making 85 Senators. The present majority with 44 votes would be reduced to 39, which with the three Populists would not be sufficient, as the majority would find itself a minority on this question with but 42 votes.

### The Armor Trouble.

The Secretary of the Navy said to the correspondent of *The Iron Age* to day

that he could find no new evidence in the alleged frauds at the Carnegie mills in naval armor steel contracts. There has been considerable correspondence with Pittsburgh parties, but the investigation made by Captain Sampson, Chief of Ordnance, covered the entire period from 1892, when the contracts began, until November, 1893, when the irregularities were exposed. Captain Sampson assumed that all the plates made during that period had the same percentage of defects and penalties, and damages were assessed accordingly. Therefore no new penalties could be levied against these same plates. The Secretary, however, wishes to hear all he can on the subject, and if anything new develops he will act as he did in the first instance.

## OBITUARY.

### E. C. HAMMER.

Emil Christian Hammer died suddenly on April 12 of heart disease at Branford, Conn. He was born on April 1, 1823, in Copenhagen, Denmark, and followed a seafaring life until he came to be first officer of a large ship sailing from Boston in the European and East India trade. Later he made Boston his home and in 1854 he went into the tea trade. In 1864 he became interested in the firm of J. J. Walworth & Co., and in this connection the Malleable Iron Fittings Company of Branford were established. He was chosen treasurer, holding this office continually till his death. For several years he also was treasurer of the Walworth Mfg. Company of Boston.

In company with the late Mr. Van Woerd of Waltham, Mass., and others, he established the United States Watch Company of Waltham, holding the office of treasurer of this company at the time of his death. About 1858 he was appointed Danish consul to Boston and the Eastern States, his consulate covering the last 36 years. He was decorated by the King of Denmark and made a member of the order of Danneborg. At the time of his death he seemed to be in the best of health. In spite of his 71 years his faculties had suffered no impairment, and instead of arranging his affairs so as to render his business duties less burdensome he was as ready as ever to shoulder additional responsibility. His career has been one of strict integrity, but the affairs of business did not prevent his pursuing a wide course of reading, and he was a lover of the fine arts, a discriminating critic, and himself an artist of no mean ability. Socially he was most genial, and he leaves a memory in which profound respect is mingled with love and affection.

### DANIEL M. CAMPBELL.

Daniel M. Campbell, after an illness of about two weeks, died the second week in April, at the Finley Hospital, Dubuque, Iowa, aged about 40 years. He came to this country from Scotland when a small boy, commencing his business career with Ray & Co., Troy, N. Y. He has represented them on the road in the West and Northwest for the past 20 years, having among other accounts more recently the American Axe & Tool Company, Northwestern Horse Nail Company, Iron City Tool Works, McKinney Mfg. Company, and Milton Mfg. Company. Although leaving his native country when very young he always spoke with a broad Scotch accent. He is referred to by his brother

salesmen as a man of excellent commercial qualities and rigidly correct in his business methods, and is said by them to have achieved remarkable success as a salesman. Of a genial temperament and generous character, he was always prompt to render practical assistance to any in need. He thus had many friends who hold him in kindly remembrance. The funeral services were held at West Troy, April 16.

## Treasury Decisions.

### 1. Polished and Cut Steel Rods. 2. Manufacture, What Does Not Constitute.

Before the U. S. General Appraisers at New York, March 10, 1894. In the matter of the protest, 60,045-15,986, of R. F. Downing & Co., against the decision of the Collector of Customs at New York, as to the rate and amount of duties chargeable on certain steel rods, imported per "Lucania," September 11, 1893. Opinion by Wilkinson, General Appraiser.

The goods are polished steel rods, larger than No. 5 gauge, in lengths of 3 and 3½ inches, and valued above 16 cents a pound. They were cut into these lengths by a lathe in order to have the ends square and to preserve the shape of the pieces. The value of the rods is given in the invoice as £12 and the cost of cutting as £9, showing a large percentage of value in the labor bestowed upon the rods since their manufacture in the original lengths. The pieces are intended to be made into drills, taps, punches and other tools.

The merchandise was assessed for duty at 45 per cent, under paragraph 215, N. T., and is claimed to be dutiable at 7 cents a pound under paragraph 146, N. T., and ½ cent a pound additional duty under paragraph 152.

The issue is whether the article is wholly or partially manufactured or not.

The large labor cost of cutting into short lengths is not of itself controlling, for the Supreme Court said in Hartranft vs. Wiegmann (U. S. Reports, vol. 121, page 615):

"The application of labor to an article, either by hand or mechanism, does not make the article necessarily a manufacture within the meaning of that term as used in the tariff laws."

In United States vs. Potts, 5 Cranch, 284:

"Round copper plates turned up and raised at the edges from 4 to 5 inches by the application of labor, to fit them for subsequent use in the manufacture of copper vessels, but which were still bought by the pound as copper for use in making copper vessels, were held not to be manufactured copper."

We find that the merchandise has not a distinctive name, character or use from the longer bars of steel from which it was cut, and we hold that it is specially provided for under paragraphs 146 and 152.

The protest is sustained accordingly.

At a meeting of the Pittsburgh committee of freight agents, held in that city on Saturday, the 14th inst., the following rail and lake rates on articles of iron and steel manufacture, in car-load lots, from Pittsburgh and points taking Pittsburgh rates to the Northwest were adopted, to take effect on Thursday, the 19th inst.: St. Paul, Minn., 18½ cents; Duluth, Wis., 17 cents; West Superior, Wis., 17 cents; Houghton, Mich., 17 cents; Hancock, Mich., 17 cents; Lake Linden, Mich., 17 cents; Marquette, Mich., 17 cents; Sault

St. Marie, Mich., 14 cents; St. Ignace, Mich., 16 cents; Green Bay, Wis., 16 cents; Fort Howard, Wis., 16 cents; Escanaba, Mich., 19 cents.

## Open Hearth Steel in Great Britain.

The British Iron Trade Association has collected statistics of the production of open hearth steel in the United Kingdom, the figures for 1893 and 1892 being as follows:

Districts.	Production of Open Hearth Steel.	
	1893 Gross tons.	1892 Gross tons.
Scotland.....	447,067	461,967
Northeast Coast.....	482,120	428,156
Wales, North and South.....	233,939	223,541
Sheffield and Leeds.....	148,337	115,491
Lancashire and Cumber- land.....	77,149	109,719
Staffordshire, &c.....	67,713	79,956
Totals.....	1,456,323	1,418,830

Out of the whole product of 1893 only 108,056 tons were basic steel, while in 1892 the output of basic steel was 78,645 tons.

Although they are not complete, the returns of the manufactured steel are of interest. There were produced of open hearth steel 39,304 tons of rails, 526,775 tons of plates and angles, 203,318 tons of bars, 211,640 tons of blooms and billets, 33,511 tons of castings, 27,532 tons of forgings, and 61,051 tons of tires.

Out of 319 acid and 40 basic furnaces 210½ acid and 25 basic furnaces were at work during 1893.

The projected construction of a four-track trolley road between Philadelphia and Harrisburg, Pa., is announced. The distance between the two points is about 100 miles. A company have been formed for the purpose, who, it is said, represent large moneyed interests. The road will be built from one end to the other on private rights of way, and all grade crossings will be avoided. The roadbed is to be of the best construction, stone ballasted, and the track will be of standard gauge. A 70-pound rail will be used. There will be no grades exceeding 4 per cent. The block signal system will be used over the entire line. The cars will be of Pullman palace pattern, with vestibules. The through cars are to make 40 to 50 miles an hour. The company are in consultation with the Westinghouse Electric Company in reference to the adoption of one of two systems, that of long distance transmission or of several power houses. The surveys have all been made, the right of way has been purchased and the work of construction has begun.

E. F. Kline, for some years superintendent of the press shops of the Homestead Steel Works, Homestead, Pa., has tendered his resignation. He has been succeeded by David Kennedy, at present superintendent of the 30 and 40 inch mills.

The Metropolitan Traction Company of New York are said to be considering a proposition from Siemens & Halske for the installation of an underground trolley system similar to that in use at Buda-Pest. The latter firm offer to equip the Twenty-third Street Crosstown line at their own expense. The likelihood of the proposition being accepted is said to be strong, although the General Electric and Westinghouse companies are in the field against their foreign competitors.

### The Pennsylvania Steel Company.

A plan for the termination of the receivership of the Pennsylvania Steel Company and of the Maryland Steel Company has been considered, and has met the approval of the committee of stockholders and that of the creditors. Its salient features are as follows:

1. Creditors to be paid 40 per cent. in cash; and

2. To be paid 60 per cent. in consolidated mortgage bonds, bearing interest at 6 per cent.

This mortgage will be made for about \$6,500,000, of which \$3,000,000 will be reserved to take up the existing first mortgages and the balance used to settle 60 per cent. due the creditors; and

3. To receive 15 per cent. upon their claims in common stock, which is to be supplied from stock to be relinquished by present stockholders as hereafter stated.

4. All debts under \$1000 to be paid in full.

5. The interest on the consolidated mortgage bonds for the first three years if not earned is to be paid in scrip. This provision fully protects the company against any lengthened continuance of the present depression in business.

This scrip, if issued, may be converted into consolidated mortgage bonds in sums of not less than \$500, which will be provided for in the amount of the proposed issue of bonds.

6. Stockholders are to provide \$1,500,000 additional capital by subscribing to 7 per cent. non-accumulative preferred stock at par.

7. The present stockholders to relinquish 50 per cent. of their present holdings to be applied—

a. To provide for the 15 per cent. payable to creditors in common stock, as stated in No. 3 above;

b. To furnish to subscribers to preferred stock one share of common stock for each share of preferred stock.

This plan has been the subject of careful consideration by the committee, and is believed to be a most equitable arrangement, and one by which the interests of the stockholders can be best preserved.

Nearly two days were consumed by the jury of the United States Circuit Court in arriving at a verdict in the suit of Fielding & Platt of England against the Morgan Engineering Company of Alliance, Ohio. The suit was brought to recover about \$5000 for machinery purchased, but was made interesting by a counter claim of \$20,000 on the part of the Alliance Company. The jury allowed Fielding & Platt \$5292.54, but also allowed the Morgan Company \$10,518.59, thus leaving \$5226.05 in favor of the latter company. The trial was one of the longest in the courts for years.

It is said that sufficient capital is now forthcoming to put the proposed Delaware and Chesapeake Ship Canal on a practical basis. The City Council of Baltimore have appointed a committee to consider plans for its construction.

The entire World's Fair exhibit of the Carpenter Steel Company of Reading, Pa., has been presented by the exhibitors to the Libby Prison War Museum, Chicago. The exhibit consists of steel armor piercing projectiles of the class recently manufactured and still in

process of manufacture for the United States Navy Department, to be supplied to the vessels of the navy. The projectiles comprised in the gift are of all the sizes manufactured, from the small 2-inch shells, weighing but 6 pounds each, to the 12 inch, weighing nearly 1000 pounds.

### New Publications.

NICARAGUA. Published by the Bureau of American Republics, Washington.

Bulletin No. 51, just issued by the Bureau of American Republics, Washington, treats of Nicaragua in the same thorough and comprehensive manner that has characterized former bulletins dealing with sister republics in Central and South America. Nicaragua, with its 40,000 square miles, is described as holding an important position among the Central American Republics. It is second in mineral wealth to the Republic of Honduras.

The mines thus far discovered are said to be very valuable, but the mining industry has not developed in proportion, because of the lack of capital, skilled labor and convenient means of transportation. Those which have been worked are said to be yielding large profits, and the Nueva Segovia region in particular possesses mineral wealth. An erroneous impression prevails that it is a country of excessive heat, but as a matter of fact, while on the low lands of the coast and forests of the plains the climate is tropical, in the higher regions it is varied and temperate. In the luxuriant forests that cover so many square miles of territory, Nicaragua possesses an element of incalculable wealth, which from its accessibility to the great markets of the world, will in the near future become the foundation of a great industry. The principal agricultural wealth of Nicaragua lies in its coffee plantations. Although still in its infancy there are large tracts of land in the Republic that are especially adapted to the cultivation of coffee. The yield in 1891 was valued at \$2,013,880, of which \$1,464,640 was net profit. The Bulletin states that for persons who have the necessary capital to start and cultivate a plantation and wait until its maturity for returns (from two to three years) there is no more profitable industry in existence at the present day. The production of India rubber, once an important industry, is rapidly decreasing from the reckless destruction of the trees, which have not been cultivated to any extent. Sugar cane grows in Nicaragua with extraordinary luxuriance, and a crop can be secured within 12 months after planting. The total production for the year 1890 amounted to about 3,500,000 pounds. Cotton of fine quality can also be produced in large quantities, but as yet the quantity raised is entirely for home consumption, among a population in 1890 of 360,000 inhabitants. Other agricultural products are bananas, in the cultivation of which great opportunities are available; cacao, corn, tobacco, rice, cocoanut, &c. The raising of cattle is said to be one of the greatest sources of the public wealth of Nicaragua.

The history of the interoceanic canal across the Isthmus is given, and also a panoramic view of the canal, which is very interesting. Railroads and transportation; laws, finance and taxation; cost of living, wages, &c.; commerce and immigration and colonization are dwelt on at length. The import duties

of Nicaragua are also given in English and Spanish. A general map of the Republic and a commercial directory complete a volume of great value to manufacturers seeking a market in the American republics, or to investors looking for new fields.

C. W. Bildt of Worcester, Mass., has been granted a patent for annealing and hardening steel rods or wire. He passes the strands continuously first through a bath of molten lead heated to a high temperature to anneal them, and then through a second bath of molten lead heated to a lower temperature than the first bath to harden them. The wire is protected from the atmosphere in passing from one bath to the other by a body of coke dust, charcoal or other non-conductor of heat.

The Chicago World's Fair buildings are still on the market. The purchaser whose offer was accepted failed to put up the required cash and the contract made with him has therefore been repudiated. Negotiations are now being made by Chicago parties for several of the buildings separately. It is a question whether \$75,000 will be realized for the buildings in the aggregate.

The Continental Wire Company, St. Louis, Mo., have completed arrangements to move their entire plant to Granite City, Ill. They will break ground on May 1 and expect to be in operation on August 1 of this year. The plant when completed will be 400 feet by 590 feet and will include both wire drawing and barbing departments. In the near future a rod mill will be erected. The railroad facilities are unsurpassed. The Wabash, Chicago & Alton, the Big Four and the Bluff Line pass immediately in front of the proposed site of the plant, and in addition to these lines a belt line connects with every line running into St. Louis from the East. Coal is cheap, taxes are low, and as above stated the shipping facilities are unsurpassed.

Fred Lehman of Naylor & Co., New York, has sailed for Europe. He will be absent for about a month.

The statement of the country's foreign trade for the nine months ending with March shows that exports exceeded imports by \$228,303,885, whereas for the corresponding period of a year ago there was an adverse balance of \$9,650,000.

Momeyer & Story of 99 John St., N. Y., have issued a price-list on Steel Plates for Locomotive, Stationary and Marine Boilers, Ship, Tank and Bridge Plates, and Machinery and Merchant Steel.

Winslow L. Horne, for a number of years a partner in the firm of William M. Horne & Co., Boston, has withdrawn from that concern and established himself as a manufacturers' agent for the sale of Steel, Iron, Nails, Forgings, &c., and opened offices at 8 Oliver St., N. Y. Mr. Horne will represent in New England the following concerns: Union Drawn Steel Company, Susquehanna Iron Company, the Reeves Iron Company and Lindsay & McCutcheon.

## MANUFACTURING.

## Iron and Steel.

The plant of the Wilkes Rolling Mill Company, Sharon, Pa., manufacturers of muck bars exclusively, has been closed down for some months, and there are no immediate prospects of resumption.

Belmont Furnace of the Wheeling Steel & Iron Company, Wheeling, W. Va., which has been idle for some months, resumed blast on the 9th inst.

As noted in these columns last week, Hubbard Furnace of the Andrews & Hitchcock Iron Company, Youngstown, Ohio, has been blown out for an indefinite period. About March 1 this firm decided to shut the furnace down as soon as the stock of ore on hand had been worked up, unless a material improvement in business would take place. On April 4 the stock of ore, coke and limestone was practically all worked up, and there was piled in the yards 14,242 tons of iron. With no available place to pile any more, it has been decided by the firm to sell this iron before putting the furnace in blast again. The furnace is in excellent condition, and can be put in blast at any time that the condition of trade may warrant.

The Canonsburg Iron & Steel Company of Pittsburgh, with works at Canonsburg, Pa., started up their new tinning pots on March 22 for the manufacture of tin and terne plate. The plant has a capacity of 80 boxes per day.

The J. Painter & Sons Company of Pittsburgh, manufacturers of hoops and bands, have just completed the erection of an 8-inch hoop mill, which was put in operation last week. This mill is expected to turn out from 25 to 30 tons of hoops per day, and was built to take the place of an old mill which was worn out. The mill was built by the Robinson Rea Mfg. Company of Pittsburgh, builders of rolling mill machinery.

The small wheel which operates the water mill at the Burden Iron Works, Troy, N. Y., has been broken, necessitating a suspension of operations. The same wheel was out of order for several days and the employees were idle.

The Reliance Wire & Iron Works, located at 186 East Water street, Milwaukee, Wis., were sold on the 8th inst. for the benefit of the creditors. The price realized was \$14,000, and the purchaser was D. D. Williams of Markesan, Wis. It is the intention of Mr. Williams to overhaul the machinery at once and to put the works in operation again as soon as the plant can be put in running order. The products made will be the same as before, and Mr. Williams is confident that he will be able to win the favor of the old customers of the defunct company.

The plant of the New Philadelphia, Ohio, Iron & Steel Company has been greatly improved during the past few months, and is now being operated to its full capacity. The product of these works consists of iron and steel sheets, plain and black, cold rolled, pickled and galvanized. Ambrose Beard, formerly of Cambridge, Ohio, is now connected with the management.

J. W. Galvin of Springfield, Ohio, is negotiating with the Chamber of Commerce of Muskegon, Mich., for the removal of his steel casting plant to the latter point.

The Johnson Company of Cleveland, Ohio, have been granted a charter of incorporation, with a capital of \$5,000,000. The new concern propose to engage in the manufacture of steel, iron and coke in all varieties and forms, mining, producing, &c., all supplies necessary for such manufacturing. The incorporators are: Tom L. Johnson, A. J. Moxham, Andrew Squire, Jas. Parmlee, H. J. Davies.

The question of the appointment of a receiver for the West Superior Iron & Steel Company and the Land River Improvement Company, both of West Superior, Wis., was heard before the courts at that place on Thursday, the 12th inst. The application is made by the Lehigh Coal & Iron Company, who also seek to compel a disclosure of the amount of stock held by John D. Rockefeller.

The blast furnace department of the Troy, N. Y., Steel & Iron Company's plant, which has been in operation for about a month, will be shut down in a few days, as all the stock which the company had on hand when the receivers were appointed

will have been converted into iron. The Bessemer steel works are still idle and there is no present prospect of their resuming operations. The Albany Iron Works department is running with about half the full complement of men, but the outlook in the department is said to be encouraging. William Kemp, one of the receivers, will go to New York to negotiate for the sale of the plant, and he is of the opinion that something may be done in the matter of disposing of the property. Several offers have been made to companies and corporations who might become purchasers. Nothing definite has yet occurred.

On Wednesday, the 11th inst., the blast was taken off the two blast furnaces of the Monongahela Furnace Company at McKeesport, Pa., on account of a shortage in the supply of coke. This was quickly remedied, however, and the furnaces again resumed blast on the following Friday.

About three months ago the puddlers employed at the Sligo Rolling Mills of Phillips, Nimick & Co., Pittsburgh, quit work on account of a reduction in wages made by the firm. Their places were supplied with new men and work has been going on right along at the above plant. The statement that a co-operative arrangement has been made between this firm and their employees, by which puddling is being done at \$3.60 per ton, the men to receive a 10 per cent. dividend at the end of the year, is officially denied.

Governor Pattison of Pennsylvania recently visited at New Castle, Pa., the plants of the Shenango Valley Steel Company and the works of the New Castle Iron & Tin Plate Company. The rolling mill equipment comprises a six mill plant of 22-inch, 23-inch and 24-inch hot and cold rolls. The engines have cylinders 30 x 60 inches and fly wheels weighing 40 tons; the bed plates and other castings are very heavy. The pickling, annealing and tinning department is a fire proof brick structure with slate roof that has a floor space of 21,720 square feet, the dimensions being 362 x 60 feet. The machine shop, also fire proof, is 70 x 60 feet.

The Edgar Thomson Steel Works, Bessemer, Pa., started on billets on Monday morning, the 16th inst., after a two weeks' run on rails.

A special from Knoxville, Tenn., states that the plant of the Watts Iron & Steel Syndicate, at Middlesborough, Ky., will start up in about 60 days and that preparation to resumption \$60,000 will be expended in improvements.

Vesuvius Furnace, at Pedro, Lawrence County, Ohio, owned by the Ironton Coal & Iron Company, is to be operated under lease by the Vesuvius Iron Company. The furnace will be ready for blast in about six weeks and will produce strictly cold blast charcoal iron.

## Machinery.

Wm. B. Pollock & Co., Youngstown, Ohio, manufacturers of steam boilers of every type, have recently added to their equipment a large punching machine. This machine is 50 inches gap, weighing 35 tons, and was made for the firm by the Cockburn Barrow & Machine Company of Jersey City, N. J. The machine has a capacity for drilling a 4-inch hole in steel 1 inch thick, and is termed by the builders a compound and direct acting machine. A prominent and novel feature of the machine is that it can be operated with triple gears for heavy work, or the gears can be dispensed with and velocity used, the change being made in less than two minutes.

J. A. Fay & Co. of Cincinnati, Ohio, have received a large order from Havana, Cuba. It will take three months to execute it, comprising, as it does, an outfit for furniture making, wagon and car building, with a planing mill equipment in addition.

The McNamara-Koster Foundry of Indianapolis, Ind., has been incorporated with a capital stock of \$10,000. Directors: Peter J. McNamara, Louis Koster and Richard Pierce.

The J. B. Ehrson Machine Company of Enterprise, Kan., contemplate the removal of their works to Kansas City, Mo. They manufacture milling machinery.

The Wheeler & Tappan Company, manufacturers of steam pumps at 13 South Jefferson street, Chicago, made an assignment on the 9th inst. to Elijah T. Harris. The assets and liabilities were placed at \$30,000 each.

The Crescent Brass & Iron Works Company, Dubois and Franklin streets, Detroit,

Mich., are building an extension, 46 x 100 feet, to be used as a foundry. The works are running full time, and when the building is completed 20 more men will be employed.

The Totten & Hogg Iron & Steel Foundry Company, Pittsburgh, Pa., manufacturers of rolls and rolling mills machinery, are operating their plant night and day. This firm are furnishing all the mills, shears, engines and boilers for the Emlyn Steel & Tin Plate Company of Summitville, Ind. They have just received an order from the Cumberland Steel & Tin Plate Company of Cumberland, Md., for three 24 inch hot mills complete, and an order from the Whittaker Iron Company, Wheeling, W. Va., for a large double shear and engine; an order from the Morewood Company of Gas City, Ind., for a large muck shear, and an order from the Ohio Falls Iron Company of New Albany, Ind., for 22 rolls.

The Westinghouse Machine Company, Pittsburgh, Pa., have declared a quarterly dividend of 1½ per cent. on the common stock of the company, payable to stockholders of record on April 18.

During the past eight fiscal years the Philadelphia Natural Gas Company of Pittsburgh, Pa., have paid 55 per cent. in dividends, or an average of nearly 7 per cent. per annum, the amount thus disbursed being \$4,107,912. During five and three-quarter fiscal years the Westinghouse Air Brake Company of Pittsburgh have paid out \$7,096,000 in dividends.

The Lodge & Davis Machine Tool Company, Cincinnati, Ohio, have received an order from the Butte, Anaconda & Pacific Railway Company for a complete outfit of machine tools, to be used in their shops at Anaconda, Mont.

The citizens of Newark, Ohio, are endeavoring to raise \$20,000, with the object of inducing the Newark Machine Works, now located at Columbus, Ohio, to remove their plant to Newark.

At a meeting of the stockholders of the H. B. Tool Company of Kent, Ohio, held last week, the following directors were elected: E. N. Barber, J. W. Hawkins, W. S. Kent, Edward Snyder and M. M. Zellers. The directors organized by electing W. S. Kent president, J. W. Hawkins secretary and general manager and E. N. Barber treasurer.

Reynolds & Co., New Haven, Conn., manufacturers of set, cap and machine screws, whose factory has been running on half time, are now employing their full force of men, nine hours a day, six days a week, in all departments. This concern have taken advantage of the dull times to put in new machinery and generally improve their plant. When all the new machines are in place the capacity of the works will be largely increased.

The Empire Foundry, at Troy, N. Y., has resumed operations.

Reports from Rutland, Vt., are to the effect that business is unusually brisk in all the machine shops of that city, and all the men who have been out of employment during the winter have returned to work.

Work has been commenced on the new plant of the Lincoln Foundry & Machine Company of Pittsburgh, which concern were recently granted a charter of incorporation. The new firm propose to engage in the manufacture of iron and steel castings and do a general machine shop business. The plant will occupy a space of 140 x 350 feet, and will have good shipping facilities. The foundry will be 120 x 244 and the machine shop 96 x 160 feet, which together with the pattern shop and offices will occupy nearly the entire space of ground. The buildings will be of iron, and the contract for their construction has been let to the Keystone Bridge Works of Pittsburgh, Pa.

The North Reading Foundry, at Reading, Pa., has resumed operations after several months' idleness. About 100 men are employed.

William Tod & Co., Youngstown, Ohio, have received an order from the Edison Electric Illuminating Company of Brooklyn, N. Y., for two 1200 horse-power engines, designed by E. F. Williams. The type is vertical, three-cylinder compound, having one high pressure and two low pressure cylinders acting on three sets of cranks, the horse-power cylinder discharging its steam into a receiver, common to both low pressure cylinders. Service to be directly connected with two 400 K. W. Edison generators, the armatures to be mounted on the ends of the crank shaft, being "overhung." The engines are intended to oper-

ate under pressures varying from 120 pounds to 140 pounds per square inch at initial and to be speeded from 110 to 120 revolutions per minute and to exhaust freely into atmosphere.

The Marshallton Iron Works, at Marshallton, Pa., have been sold by the sheriff to W. S. Hilles, attorney for the creditors, for \$75, subject to judgments amounting to about \$52,000.

William B. Turner, who about a year ago erected a new foundry at Schenectady, N. Y., has assigned. The liabilities are between \$15,000 and \$20,000; the assets include the foundry, on which \$28,000 was expended, and other real estate. The foundry was never put into operation.

The Lidgerwood Mfg. Company of New York sold 12 Locke Miller cableways during the past month, aggregating about \$90,000.

The Detroit Twist Drill Company were organized at Detroit, Mich., on the 9th inst., and succeed to the business of the Graham Twist Drill & Chuck Company. The following are the officers, directors and stockholders: Wm. Reid, president; Harry S. Hodge, vice-president; N. G. Williams, Jr., secretary; treasurer and general manager, Chas. M. Swift. Henry F. Hiller continues as superintendent, while Donald Churchill will represent the new company among the trade. The works possess greater facilities than ever for making drills, chucks and kindred tools.

Walker & Pratt's foundry, at Water-town, Mass., will be operated four days a week until further notice.

#### Hardware.

Colt's Patent Fire Arms Mfg. Company, Hartford, Conn., are about to erect two brick factories, one 270 x 50 feet, two stories high, and another 85 x 50 feet, three stories high.

The works of the New York Knife Company, Walden, N. Y., will be shut down on May 1. The uncertainty about the tariff is given as the reason for shutting down. In prosperous times the company gave employment to 350 persons.

The Cadillac Handle Company have been organized at Cadillac, Mich., with a capital stock of \$20,000. E. H. Cutler, W. W. Mitchell and A. W. Mitchell are the incorporators. The new company succeed the firm of Cutler & Plant, who have been engaged in the manufacture of handles at Cadillac for about two years. The Messrs. Mitchell, who are the principal stockholders, are wealthy lumbermen.

The Howe Scale Company, Rutland, Vt., are now running nine hours a day, five hours a week, instead of seven and a half hours a day for six days, thus giving the employees a whole day Saturday.

It is understood that O. E. Lewis contemplates the erection of a wire making plant on North Bryant street, Malden, Mass.

The American Flexible Wire Company, Memphis, Tenn., have been incorporated by T. H. Logwood, C. M. Redford, J. A. Spain, H. M. McKay and J. O. Bradley. It is the intention of the company to manufacture flexible wire goods to be used as is cotton rope for plow lines, teamster lines, halters, grazing chains, clothes lines, &c.; in fact, for any purpose for which cotton or hemp rope is now used. These goods will be made of No. 12 galvanized wire, and in such a way as to prevent tangling. It is stated that a pair of plow lines will not weigh more than  $\frac{1}{4}$  pound more than a pair of cotton rope lines, while they will be as easily handled and last much longer. The company are having an automatic machine made which will enable them, they state, to compete with the low prices of cotton goods.

The Wyckoff Harvester Company have been organized at Jamestown, Pa. The capital stock is \$100,000. The directors are A. E. Hall, W. A. Kent, E. C. Hall, R. N. Marvin, A. N. Broadhead, J. N. Wyckoff and F. E. Gifford. The company have obtained possession of the Wyckoff implement factory at Perry, N. Y., and will remove the establishment to Jamestown. Five acres of land have been purchased and buildings will be erected at once. It is thought that the plant will be fully established by August 1, and that 100 men will be employed at the outset.

The Ludlow-Saylor Wire Company, St. Louis, Mo., have within the past ten days received a number of orders for ornamental metal work. Among those received they advise of the following, which,

while they show the class of work they make, also indicate the extent of the territory covered by them: A partition screen and foot rail in oxidized silver, for the banking house of Ignaz Russek, Schlebenburg, Texas; the entire metal work for the Mechanics' Loan and Savings Institute, Hagerstown, Md., and a pair of wrought iron gates for a private residence at Newport, R. I. As mentioned in *The Iron Age* two weeks since, they also shipped a handsome bank railing to San Diego, Cal., thus taking in the Pacific Coast, the Atlantic Coast and Texas, the extreme Southwest.

The Spicer Mfg. Company, New Philadelphia, Ohio, report a shipment to the Ellwood Tin Plate Company of Ellwood City, Pa., of a full carload of their standard sheet metal trucks for use in the tin plate department.

The Bloomsburg Brass & Copper Company of Bloomsburg, Pa., report business good with them. They now make all sizes of brass and copper seamless drawn tubing up to 7 inches diameter. They furnish employment for 72 hands and are running on full time.

The Cleveland Novelty Company, Cleveland, Ohio, advise us that they have taken advantage of the dull times to more than double the capacity of their factory.

The Sterling Emery Wheel Company have made arrangements that permit of the factory, at Tiffin, Ohio, being started up on full turn. The management, we are advised, is in strong hands and the business is moving along in the regular channels. We are advised good orders are coming in and that there is every indication of an increasing trade. Their New York office and warehouse is at 174 Fulton street.

The annual meeting of the stockholders of the Joseph Dixon Crucible Company was held at their offices in Jersey City, N. J., on April 16. Out of 7345 shares 7215 votes were cast for the same Board of Managers that has heretofore conducted the affairs of the company. The board consists of E. F. C. Young, John A. Walker, Daniel T. Hoag, Richard Butler, William Murray, Joseph D. Bedle and Jerome D. Gillett. In the organization of the board Mr. Young was elected president, Mr. Walker vice-president and treasurer, and George E. Long secretary. The company were founded by Joseph Dixon in 1827, and were organized as a stock company in 1868.

#### Miscellaneous.

The Westinghouse Electric & Mfg. Company of Pittsburgh, Pa., have materially increased the working forces in their several plants on account of the accumulation of large railway orders.

H. K. Porter & Co., Pittsburgh, Pa., builders of light locomotives, report that business is showing some improvement. At present this firm are employing a short force of men nine hours per day.

The Warren Hardware Company, Warren, Ohio, will soon commence the erection of a new plant for the manufacture of steel ranges. The property on which this plant will be located lies between the Pittsburgh, Painesville & Fairport and New York, Pennsylvania & Ohio railroads, thus affording excellent shipping facilities. The main building will be 40 x 150 feet in size, and it is expected the plant will be ready for operation within 60 days.

The Delaware, Lackawanna & Western Railroad Company have placed the order for two engine house roofs with the Berlin Iron Bridge Company of East Berlin, Conn. Both roofs will be covered with the Berlin Iron Bridge Company's patent anti-condensation corrugated iron.

At the annual meeting of the stockholders of the King Bridge Company, which was recently held in Cleveland, Ohio, the following were elected directors: James A. King, Dan P. Eells, H. W. King, Harley B. Gibbs and H. W. Osborn. The directors elected James A. King president, H. W. King vice-president, and Harley B. Gibbs secretary and treasurer.

The Union Iron Works of San Francisco, Cal., have secured the contract for constructing a steel reservoir to hold 500,000 gallons of water. It will be built on the summit of Clarendon Heights, south of Golden Gate Park.

Among recently authorized corporations in Illinois are the following: Chicago Pneumatic Railway Gate Company, Chicago; capital stock, \$200,000; incorporators, George H. Clark, Paul Schwarzelose and

Frank A. O'Donnell, Carmichael-Wilks Range Company, Chicago; capital stock, \$50,000; incorporators, D. L. Carmichael, W. B. McCloud, Perry Russell, St. Louis Electric Brake Company, East St. Louis; capital stock, \$2,000,000; incorporators, J. L. Black, Samuel Kesh and W. V. Wolcott, Chicago Folding Baby Carriage Company, Chicago; capital stock, \$200,000; incorporators, Noel Durand, John Ellis and Elbert McGuffin, Donan-Trapp Climax Gas Producer Company, Chicago; capital stock, \$100,000; incorporators, W. Clyde Jones, George L. Cragg and George S. Buell.

The plant and real estate of the old Malleable Iron Company, located at Youngstown, Ohio, have been sold to the New York State Electrical Company of Canisteo, N. Y., who will utilize the works for the manufacture of electrical supplies.

The foundry and blacksmith shops of the Rogers Locomotive Works, at Paterson, N. J., have started up in part.

The cast iron pipe works of the Glamorgan Company, at Lynchburg, Va., have been destroyed by fire.

The New Haven Rolling Mill, at Fair Haven, Conn., has resumed, after a shut down of three weeks.

The McNeal Pipe & Foundry Company of Burlington, N. J., have placed the contract for two cleaning sheds with the Berlin Iron Bridge Company of East Berlin, Conn.

Letters just received by Glasgow merchants from Canada show that the makers of iron and steel goods in the United States are carrying away by an extremely low range of prices orders which hitherto have almost invariably been obtained by Scotch makers. Two or three extracts from the letters alluded to will, says the London *Ironmonger*, be of interest to our readers. One correspondent writes: "For the first time since we have been buying steel boiler plates we can purchase cheaper in the States than we can in Glasgow. The quotations we get from the United States compel us to send our orders to manufacturers there. There seems to be no bottom to prices in the States at present." Another letter says: "Our market prices are continually shrinking, and the indications are that they will go still lower. . . . Since 1890 Bessemer pig has shrunk in value \$15 per ton, and Bessemer steel billets nearly \$20. Our manufacturers say these prices are unremunerative, even if they do not mean a loss, but they are all eager for business." A third letter has the following: "Unfortunately you were too dear, the Americans having named a price that secured the order. You have mentioned the competition from that quarter in some of your recent letters. It means at present that they are going to secure the bulk of the business in steel plates, hoops, wire, tubes, and sundry other lines that always came from your country or the Continent. It is not a pleasant matter for many of us; but it may be as well for some makers on your side to waken up to the fact that the world is no longer their market."

Improvements at the Watervliet, N. Y., arsenal are being hurried along rapidly toward completion. Many new facilities are being added to the plant. The manufacturing of guns is progressing as usual, although the full complement of men is not at present employed. Several machines will be put in the new shops, the contract for which has been awarded to the Pond Machine Tool Works of Plainfield, N. J., for \$206,920. The machines which will be erected are five turning, finishing and boring lathes and one threading and slotting machine. These will be used to construct guns of 12 to 16 inch caliber, and they will be ready about the middle of next year.

## The Iron and Metal Trades.

Interest has centered this week in the large purchases of Bessemer Pig Iron in Pittsburgh and the Valleys. Our Pittsburgh correspondent estimates the aggregate of these transactions at 100,000 tons. The largest purchase was that of a mill in Central Pennsylvania, which has the Iron converted at an adjacent Steel works. The quantity involved was 30,000 tons, of which 10,000 tons were bought at Pittsburgh at \$10 at furnace, the latter, however, being favorably located as to shipments. Efforts to duplicate the price were unsuccessful. The balance, about 20,000 tons, was placed with Valley furnaces at a price somewhat higher than the Pittsburgh equivalent named. Five other blocks of 10,000 tons each were also taken, generally, however, at somewhat better figures. One of these was a second purchase by a Central Pennsylvania Steel mill, one was by an adjoining rolling mill, and one by a firm in New York identified with the Copper trade. A reported purchase of 20,000 tons by one of the largest firms of Iron merchants in the country was alluded to us last week.

In the Soft Steel trade Pittsburgh is pretty steady, but there is evidence that Wheeling has been weakening lately and that buyers can do better, relatively, in that market. Still, a fair amount of business has been done in Pittsburgh during the week at prices reported to be higher.

Comparatively little tonnage for the Structural and Plate mills is coming up in the cities west of the Alleghany Mountains, while a certain amount of work continues to originate in Boston, New York and Philadelphia. The mills in Eastern Pennsylvania are picking up quite a good deal of small business, and are better employed than they have been. But prices are still terribly low.

The trade in Steel Rails for steam roads continues very dull. There is more activity, accompanied by an unprecedented demoralization in prices, in Girder Rails for street roads. There seems to be little doubt that \$21 at mill has been shaded, and there are rumors that even lower prices have been made.

In the Wire trade the rush is over and a weakening tendency is developing. As showing the magnitude of this business, it is reported that the Rod mills last year used over 640,000 tons of 4-inch Billets.

We are advised by wire by the manager of the leading furnace company in the South that as yet no furnaces have been closed down in the Birmingham district as the result of the miners' strike. He adds that opinions differ widely as to whether the strike will be protracted or not. Still some of the companies are warning their agents to be careful about entering further engagements.

## Philadelphia.

Office of *The Iron Age*, 220 South Fourth St.,  
PHILADELPHIA, Pa. April 17, 1894.

The intimations of an improving market made in our last report appear to have been confirmed by recent developments. A considerable amount of business has been placed, and there are very few furnaces or mills that have not made substantial additions to their order books. There is also quite a good deal of business under negotiation, and while prices show little or no improvement, the sentiment is more hopeful than it has been for many weeks past. The increase in the output of Pig Iron concurrently with a decrease in stocks is a significant feature, and is not without influence on those who closely watch the course of events. There is, in fact, plenty of material for building up an optimistic theory, and as the trade seem to be drifting round to that view of the situation, the chances are that it will be the winning side for awhile at all events. No great advance is looked for, but it is expected that the next two or three weeks will show that the corner has been turned, and the building up process fairly commenced. Some close observers are not sanguine of further immediate improvement on the ground that requirements for the next 60 or 90 days are pretty well covered, and that while producers will be kept busy on deliveries, new business is not likely to come in to an extent that will affect prices. This is a conservative and not unreasonable view of the situation, but there are some very unusual possibilities in the opposite direction, such for instance as unprecedentedly low prices, decreasing stocks, and increasing consumption. Cost has been worked down to the lowest possible fraction, and in many cases it will be difficult to increase the output without increasing cost. The Coke and Soft Coal situation is not all that producers could desire who figure on cheap fuel. With hot weather and a better demand for rolling mill products, the same feature in regard to labor will probably be met with. Taking all these contingencies into account, the chances seem to be pretty much all in one direction, although, of course, it may be that the past week's little spurt of activity will be followed by a period of dullness, in which case it will be useless to look for any movement in prices except such as we have had during the past three months, some days a little better, some days a little worse, but no appreciable gain after weeks and weeks of backing and filling in both directions.

**Pig Iron.**—It is a difficult matter to report this article except in general terms. A better demand is reported on all sides, and for nearly all grades of Iron, but in the matter of prices everything is at sixes and sevens. The only way to get an exact quotation is to name brand, quantity, delivery and terms of settlement, and as these vary, prices vary. The quotations given below fairly indicate the range of quotations in Philadelphia and vicinity, although at Harrisburg, York and Susquehanna Valley points 25¢ @ 40¢ less has been accepted owing to advantages in freights, &c., but even then there is frequently a wide disparity in quotations. The feature of the past week has been good buying of low grade Irons at about \$10.25, delivered, and of Bessemer at \$11.65 @ \$11.85. In this connection it may be noted that one of the Sheridan furnaces near Reading is

to be run on Bessemer, sales of several thousand tons of the product having been made for summer delivery. Southern Irons are selling at about \$11.75 for No. 2 X, and No. 1 X at \$12.50, while Pennsylvania brands are supposed to bring somewhat higher figures. The feeling in regard to prices is a little mixed, but it is conceded that consumers are taking hold more freely, and to that extent the situation is improving. General quotations for Philadelphia and equivalent points are about as follows:

Bessemer.	.....	\$11.65	@	\$11.85
Standard No. 1 Foundry X	.....	12.50	@	13.00
Standard No. 2 Foundry X	.....	11.75	@	12.25
No. 2 Plain.	.....	10.75	@	11.00
No. 1 Soft.	.....	11.00	@	11.50
No. 2 Soft.	.....	10.50	@	10.75
Standard Gray Forge.	.....	10.40	@	10.75
Ordinary.	.....	10.25	@	10.50

**Steel Billets.**—The market is slightly irregular, but on the whole makers claim to be in better shape than for some time past. Several of the larger concerns have orders enough to employ them to the end of next month, and as there is still a good demand they are disposed to stand out for higher figures. Asking prices on new business are from \$17.25 to \$17.50, delivered, but a good many options that were out at about \$17 are being taken up. It will not be easy to secure new contracts at the advanced figures, unless to cover actual requirements. The immediate tone of the market is undoubtedly firmer, and as consumption appears to be increasing, it is not unlikely that the ultimate outcome will be a somewhat higher range of quotations.

**Finished Material.**—There is a better feeling in all departments, but it cannot be said that the demand is specially large. Small orders are very numerous, and some mills are quite busily employed in meeting this class of trade. In fact, the local improvement is due almost exclusively to the demand for specialties, and to that from the smaller consumers. Taking an average of the situation, it may be said that work at near by mills is more general than it has been for months past. Prices are about as low as ever, and the orders do not extend very far ahead, but compared with the winter months there is a very distinct improvement, and the trade think they see far enough ahead to warrant belief in its permanency. The mills engaged on structural work are all doing a comparatively good business, and it is claimed that they are getting an average of \$2 ½ ton more for their work than at any time during the three previous months. Quotations need not be advanced, however, as the improvement is due more to the absence of cuts than to any advance in asking prices. The Sheet mills find it difficult to meet Western prices, and are not running more than half to two-thirds their capacity, although there has been more inquiry the past day or two, which may signify more business, if prices can be adjusted. General asking prices are about as follows:

Grooved Skelp, delivered.	1.15¢	@	1.25¢
Standard Refined Bars	1.30¢	@	1.40¢
Medium quality.	1.15¢	@	1.20¢
Tank Steel.	1.20¢	@	1.30¢
Heavy Plates.	1.30¢	@	1.40¢
Shell.	1.40¢	@	1.50¢
Flange.	1.60¢	@	1.80¢
Angles.	1.20¢	@	1.30¢
Beams and Channels	1.40¢	@	1.60¢

**Old Material.**—There is an improvement in the demand, but in some articles prices are lower, while in others they are a shade firmer. General quo-

tations for lots delivered are about as follows:

Heavy Melting Steel.....	\$10.00 @ \$11.00
Light Melting Steel.....	8.00 @ 9.00
No. 1 Wrought Scrap.....	10.00 @ 11.00
Machinery Cast.....	9.50 @ 10.00
Wrought Turnings.....	8.50 @ 9.00
Cast Borings.....	6.50 @ 7.00
Old Iron Rails.....	12.00 @ 12.50

## Pittsburgh.

(By Mail.)

Office of *The Iron Age*, Hamilton Building, PITTSBURGH, April 17, 1894.

The principal occurrences of the week were the ending of the Coke strike and the purchases of large blocks of Bessemer Pig in the Pittsburgh and Valley districts by Eastern mills for forward delivery. The Soft Steel makers having gotten their order books in good shape are holding out for higher prices. Structural material and Plates are in moderate demand, with no improvement in prices. The Rod, Wire and Wire Nail market is losing ground rapidly, sharp declines in prices having occurred. Sellers for delivery in the Eastern markets decline to guarantee freight rates, but there are no indications of any immediate advance in rates. Summing up the situation, it can be said that the outlook for tonnage is hopeful, which may lead to better prices after awhile.

**Pig Iron.**—A number of large sales of Bessemer Pig have been made during this month to Eastern mills, while a considerable tonnage for speculative purposes has also been closed. One Central Pennsylvania mill is credited with the purchase of a round block of 30,000 tons, and four other concerns with 10,000 tons each. Several sales, involving 2000 and 3000 ton lots, have also been closed. In the West a Cleveland mill bought 10,000 tons, and it is estimated that close to 100,000 tons of Bessemer Pig for late delivery have been closed this month. Much of this Iron is for actual needs, while the balance will be stored, in the hope that favorable opportunity for its sale will be presented. It is claimed that \$9.75 at Valley furnace was the lowest price touched in the transactions and \$10 the highest. The first named price is equal to \$11.25 east of Harrisburg to Philadelphia. The consumption of Bessemer Pig by Pittsburgh and Wheeling is very heavy just now, and the closing down of Rosena Furnace for relining puts another buyer in the market. The Wheeling Steel mills are running full and are large buyers of Bessemer for prompt shipment. A Wheeling interest will probably add another stack to their equipment in the near future. It would seem that with all these favorable conditions prices of Bessemer Pig should show improvement, but such is not the case. There is no change in the situation in Gray Forge and Foundry Iron. Both are in light demand with prices ruling very low. We quote as follows:

Neutral Gray Forge.....	\$9.25 @ \$9.40, cash.
All-Ore Mill.....	9.35 @ 9.50 "
No. 1 Foundry.....	11.00 @ 11.25 "
No. 2 Foundry.....	10.25 @ 10.50 "
No. 3 Foundry.....	9.75 @ 10.00 "
Bessemer.....	10.35 @ 10.50 "

**Ferromanganese.**—We continue to quote at \$58, delivered, for 80% domes-

**Billets.**—The Steel makers both here and at Wheeling have their order books in good shape and are asking higher prices for Steel, with the result that buyers are holding off until it has been demonstrated whether the advance will be sustained. Three of the Pittsburgh

mills report that they have all the Steel for this and next month they can turn out and for this reason are declining to quote. The other two makers are also well fixed and are asking \$15.75 @ \$16 for the next two months delivery. We are advised of sales aggregating some 12,000 tons at prices ranging from \$15.65 to \$15.75 at maker's mill. It is stated that efforts are being made in certain quarters to bear the market, but the large tonnage booked by the mills should enable them to maintain their present strong position.

**Plates.**—The leading mills are fairly well fixed with orders and considerable tonnage is in sight, so that the situation, as far as demand goes, is very hopeful. Prices are no lower than they were a month or two ago, and it is believed the next change will be for the better, although it may be long delayed. We quote as follows: Tank Steel, 1.10¢ @ 1.20¢; Flange, 1.50¢ @ 1.60¢; Shell, 1.30¢ @ 1.40¢; Fire Box Steel, 1.75¢ @ 4¢, according to quality.

**Sheets.**—Mills report heavy inquiries for forward delivery and indications are that the large orders will soon begin to be placed. We quote as follows: No. 24, 2 15¢; No. 26, 2.25¢, and No. 27, 2.35¢, at mill. For round lots these prices would probably be slightly shaded.

**Structural Material.**—Considerable bridge work is being placed, but otherwise the situation is unchanged. The leading maker here, through an identified interest, is credited with securing a number of fair sized contracts, but at very low prices. We quote as follows: Beams and Channels up to 15 inches, 1.15¢ @ 1.25¢; Angles and Universal Plates, 1.10¢ @ 1.20¢; Tees, 1.25¢ @ 1.35¢.

**Bars.**—The tonnage offering is nearly altogether for small lots, and the large orders that in former days gladdened the hearts of makers are not forthcoming. However, the volume of trade is fair and prices, while not higher, are being maintained. The belief is expressed that prices have reached bottom and purchases at ruling prices will not be a mistake. We quote Common Iron Bars at 1¢ @ 1.10¢; Soft Steel Bars, 1.10¢ @ 1.20¢, at mill.

**Merchant Steel.**—Nothing new developed during the week, and we continue to quote Bessemer Machinery, 1.80¢ @ 1.35¢; Open Hearth Machinery, 1.57¢ @ 1.65¢; Open Hearth Spring, 1.70¢ @ 1.75¢; Toe Calk, 1.80¢ @ 1.85¢; Machine Straightened Tire, standard quality, 1.60¢ @ 1.65¢; Cold Drawn Steel Shafting, 2.57¢ base; Tool Steel, 5¢ @ 7¢ for ordinary grades.

**Pipes and Tubes.**—Pittsburgh mills have all bid on an order for some 75 miles of Line Pipe, bids for which will be opened at Lafayette, Ind., this week. Several other smaller contracts are in the market, for which prices will probably soon be asked. General trade is quiet and prices continue very low.

**Muck Bars.**—There is no demand and prices are merely nominal at \$19 @ \$19.50, delivered, for best grades.

**Skelp Iron and Steel.**—We continue quotations as follows: Grooved Steel Skelp, 1¢ @ 1.10¢, according to size and order; Sheared Steel Skelp, 1.10¢ @ 1.20¢; Grooved Iron Skelp, 1.15¢ @ 1.25¢; Sheared Iron Skelp, 1.25¢ @ 1.35¢.

**Wire Rods.**—There are no inquiries and Rods for delivery during May and June are offered at \$24 at maker's mill.

**Barb Wire.**—The heavy demand which has prevailed during the last two or three months has fallen off perceptibly during the past week. Prices are reported as somewhat easier and we quote Four-Point Galvanized at \$2.15, Pittsburgh. It is intimated that this price has been shaded during the past few days.

**Wire and Cut Nails.**—Makers are fairly busy, but there is considerable competition for new business and attractive prices are being made. We quote Wire Nails at 95¢ @ \$1 at mill in carload lots. There is only a fair demand for Cut Nails and we continue to quote at 90¢ @ 95¢ at mill for the usual averages. It is stated that the first named quotation is occasionally shaded for attractive orders.

**Connellsville Coke.**—The Coke strike is ended, the men returning to work as fast as places can be found for them. For the week ending Saturday, April 7, there were 9013 ovens active and 8500 idle, the estimated production for the week being 71,987 tons. Compared with the production of the previous week this was a decrease of 35,114 tons. In the active list of ovens there was a net decrease of 1853 ovens. We continue to quote Furnace Coke at 85¢ @ 90¢; Foundry Coke at \$1 @ \$1.10, in tons of 2000 pounds f.o.b. cars at region.

## Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fifth and Main Sts., CINCINNATI, April 18, 1894.

There has been a fair volume of business in Coke Pig Iron during the week ending to day, but not much movement in other kinds. Prices as a rule were well sustained by the furnaces, which have sold mainly at delivered prices and therefore buyers in many instances have secured supplies at a lower cost to themselves. There have been concessions made in exceptional instances on No. 2 Soft and Gray Forge, but at the close a firmer tone prevails, the strike or threatened strike among the laborers in the South making sellers cautious, although it is thought that the difficulties will be adjusted without any great amount of friction. The sales for spot and forward delivery aggregate for the week upward of 15,000 tons and sales have been contracted for the remainder of the year at the same prices as are accepted for spot delivery. The buyers of Iron are mainly stove and agricultural works. The Iron Pipe works are melting considerable Iron but are not purchasing much. The market, as a whole, while not essentially better, is certainly no worse than it has been. Quotations are merely nominal, as follows:

### Foundry.

Southern Coke, No. 1.....	\$10.50 @ \$10.75
Southern Coke, No. 2.....	9.25 @ 9.50
Southern Coke, No. 3.....	8.75 @ 9.00
Ohio Soft Stone Coal, No. 1.....	14.50 @ 15.50
Ohio Soft Stone Coal, No. 2.....	14.25 @ 14.50
Lake Superior Coke, No. 1.....	18.00 @ 18.50
Lake Superior Coke, No. 2.....	12.00 @ 12.25
Hanging Rock Charcoal, No. 1.....	17.00 @ 17.50
Hanging Rock Charcoal, No. 2.....	16.50 @ 17.00
Tennessee Charcoal, No. 1.....	18.00 @ 18.50
Tennessee Charcoal, No. 2.....	12.00 @ 12.50

### Car Wheel and Malleable Irons.

Standard Southern Car Wheel.....	16.25 @ 17.00
Lake Superior Car Wheel and Malleable.....	16.50 @ 17.00

### Forge.

Gray Forge.....	8.50 @ 8.75
Mottled Coke.....	8.25 @ 8.50

## Chicago.

(By Telegraph.)

Office of *The Iron Age*, 59 Dearborn street, Chicago, April 18, 1894.

The past week was one of marked quietness in nearly every line. The unpleasant feature of the situation is that prospects apparently indicate a continued dull period. Merchants and manufacturers think that a renewal of activity is hardly to be expected until some time in May. The building troubles now in progress are slowly being settled, but their influence is likely to be felt for two or three weeks in the restriction of building operations.

**Pig Iron.**—Transactions in both local and Southern Coke have been almost wholly confined to small lots. The most important sale last week was one of about 2000 tons of local Iron. The demand for small lots comes from all classes of customers, but the aggregate volume of such business is by no means satisfactory to furnace companies. Consumers are still apprehensive of disturbing influences which may again unfavorably affect prices, and consequently inquiries are unusually light. Very little is doing in Lake Superior Charcoal. Quotations are given as follows for cash:

Lake Superior Charcoal.....	\$15.00	@	\$15.50
Local Coke Foundry, No. 1.....	11.25	@	11.50
Local Coke Foundry, No. 2.....	10.50	@	11.00
Local Coke Foundry, No. 3.....	10.00	@	10.50
Local Scotch.....	11.50	@	11.75
Ohio Strong Softeners No. 1.....	13.00	@	14.00
Southern Silvery, No. 1.....	.....	@	11.50
Southern Silvery, No. 2.....	.....	@	11.00
Southern Coke, No. 2.....	10.00	@	10.35
Southern Coke, No. 3.....	9.75	@	10.00
Southern, No. 1, Soft.....	10.25	@	10.50
Southern, No. 2, Soft.....	9.75	@	10.00
Tennessee Charcoal, No. 1.....	15.00	@	15.50
Tennessee Charcoal, No. 2.....	14.50	@	15.00
Alabama Car Wheel.....	17.85	@	18.00
Jackson County Silvery.....	15.00	@	16.00
Other Ohio Silvery.....	13.00	@	13.50
Coke Bessemer.....	12.00	@	.....

**Bars.**—Manufacturers report only a light trade in progress. Consumers are taking only small quantities and an order for 100 tons now appears to be an exceptionally large order. Even inquiries are scarce. Prices continue about as previously reported on the basis of 1.05¢ @ 1.15¢, Chicago, for Bar Iron and 1.15¢ @ 1.25¢ for Soft Steel Bars. Jobbers report a small demand for Iron and Steel from stock. They quote prices for such lots, 1.25¢ @ 1.35¢ for Bar Iron and 1.30¢ @ 1.40¢ for Soft Steel Bars.

**Structural Material.**—Only one new building project of any consequence is reported in sight in the city. The demand for Beams and other Building Shapes continues trifling from city consumers on account of the building troubles, but country business keeps up as previously reported. Bridge work is still backward. Quotations on mill shipmen's, Chicago delivery: Beams and Channels, 1.30¢ @ 1.40¢; Tees, 1.50¢ @ 1.60¢; Angles, 1.30¢ @ 1.40¢; Universal Plates, 1.30¢ @ 1.35¢. Small lots from stock are sold at an advance of 10¢ @ 15¢ per 100 lb above these prices.

**Plates.**—The volume of business in either mill shipments or small lots from stock is considerably under that of March. But in this line April and May are usually the poorest months of the year. Mill shipments, Chicago delivery, may be quoted as follows: Tank Steel, 1.35¢ @ 1.40¢; Flange Steel, 1.60¢ @ 2.10¢; Fire Box, 2¢ @ 2.05¢. Store prices are as follows: Iron or Steel Sheets, Nos. 10 to 14, 1.80¢ @ 1.90¢; Tank Steel, 1.60¢ @ 1.85¢; Flange Steel, 2.10¢ @ 2.35¢; Boiler Tubes, 75¢ off.

**Sheets.**—Trade in Black Sheets is much better; orders are increasing. Buyers have evidently made up their minds to place contracts for season shipments at the prices now ruling. No. 27 Common Iron is quoted at 2.25¢ @ 2.35¢, Chicago delivery. Small lots from stock are quoted in a regular way at 2.70¢. Galvanized Iron is also in better demand, but the volume of business is hardly on a parity with that in Black Sheets. Manufacturers quote 77¢ and 5% discount for full shipments. Small lots from stock are selling at 75 and 10%. Sheet Copper is unchanged at 14¢ base, with no discount.

**Merchant Steel.**—Here and there an implement manufacturer is buying a little more in order to make up a larger stock of machines than he had anticipated, but in a general way trade is quiet. We quote mill shipments, Chicago delivery: Smooth Finished Machinery and Tire, 1.70¢ @ 1.80¢; Open Hearth Spring Steel, 1.85¢ @ 1.90¢; Bessemer Machinery, 1.55¢ @ 1.60¢; Bessemer Tire, 1.40¢; Ordinary Tool Steel, 6¢ @ 7¢; Specials, 12¢ and upward.

**Billets and Rods.**—The situation has not changed in any respect. Mills are full to July, and continue to quote nominal prices \$17 @ \$17.25. If they were in a position to take contracts for early delivery they would be able to get an advance. The Wire Rod mills are in the same condition; nominal quotations \$26.50.

**Rails and Track Supplies.**—There is nothing new to report in Steel Rails. Quotations continue at \$25 @ \$27 for standard sections of Steel Rails; 1.40¢ for Splice Bars; 2.30¢ @ 2.40¢ for Track Bolts with Hexagon Nuts, and 1.70¢ @ 1.80¢ for Spikes.

**Old Rails and Wheels.**—Offers from Eastern consumers for Old Iron Rails are being received equivalent to \$9.75, Chicago. This is the highest bid now made for Old Rails, but the local roads are not as yet willing to meet this price. Old Steel Rails are in some demand. While \$6.50 @ \$6.75 seems to be a fair quotation on short lengths on a parity with Pittsburgh, yet holders are not disposed to make sales at such rates. Long lengths are quoted at \$9.50 @ \$10. It is worthy of note that Old Iron Rails and long lengths of Steel Rails are now being quoted at about the same price. Old Car Wheels are quiet, with nominal quotations \$10 @ \$10.50.

**Scrap.**—Sales are reported in limited quantities of Forge Scrap at \$8 @ \$8.50; selected Heavy Cast at \$8 and selected Mill at \$7. These prices vary somewhat from quotations made by dealers in a regular way. They quote the following selling prices per net ton: Railroad Forge, \$9; Dealers' Forge, \$8 @ \$8.50; No. 1 Mill, \$6.50; Pipes and Flues, \$6; Heavy Cast, \$7 @ \$7.50; Stove Plate, \$5 @ \$5.50; Fish Plates, \$10; Horseshoes, \$9; Mixed Steel, gross ton, \$5.

**Metals.**—Carload lots of Lake Copper are still quoted at 10¢. The Great Northern Railroad strike cuts off supplies from Montana Copper Works, but it will have to continue for some time to have any effect on prices, so that casting Copper is unchanged at 9¢. Spelter can now be bought for 3.35¢. Speculative holders are parting with their stock at less than producers' prices. Pig Lead is firmer at 3.30¢. Good sales have been made at this figure within the past week.

Cramer & Burt, agents of the Baltimore Copper Smelting & Rolling

Company and of the Woodward Iron Company, together with H. N. Elmer, agent of the Trenton Iron Company and the New Jersey Steel & Iron Company, have removed from the Western Union Building to suit 1114 in the Monadnock Block, corner of Dearborn and Jackson streets, Chicago.

F. K. Bowes has recently been appointed Chicago sales agent for the Sheets manufactured by the Sharon Iron Company, Limited, of Sharon, Pa. The company's products in this line are Iron and Steel Sheets of light gauges, Cold Rolled Sheets, Stove Body Sheets and Galvanized Sheets. They have just entered the market with Galvanized Sheets, but have already established a reputation for high quality. Mr. Bowes' office is in room 5 Grand Pacific Exchange, Chicago.

Southern furnace companies are advising their agents to go slow in making contracts for forward delivery, as all the Alabama coal mines are on strike.

## St. Louis.

(By Telegraph.)

Office of *The Iron Age*,  
Bank of Commerce Building, St. Louis, April 18, 1894.

**Pig Iron.**—The market remains practically the same as last reported. The volume of business is limited and prices are unchanged. Consumers of Pig Iron anticipate still further reductions in freight rates and are deferring their purchases until they see whether the expected reduction will materialize. We quote as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry.....	\$10.75	@	\$11.00
Southern Coke, No. 2 Foundry.....	9.75	@	10.00
Southern Coke, No. 3 Foundry.....	9.50	@	9.75
Southern Gray Forge.....	9.25	@	9.50
Southern Car Wheel.....	16.75	@	17.75
Ohio Superior Car Wheel.....	16.25	@	16.50
Ohio Softeners.....	14.25	@	14.50

**Bar Iron.**—There is a slight falling off in demand, and prices are weaker in consequence. Mills quote from 1¢ to 1.05¢, and are not securing any large business even at these figures. At 1¢ the market seems to have touched bottom, as offers of less have been refused. Jobbers ask 1.25¢ @ 1.30¢, from store, according to quantity.

**Barb Wire.**—Mills report an active demand, but prices continue in the unsettled condition as last noted. Painted is quoted at \$1.85 and Galvanized at 40¢ per hundredweight additional.

**Wire Nails.**—The condition of the Wire Nail market continues to grow worse instead of better. The general quotation is \$1.10 @ \$1.15, but carload buyers seem to be able to do considerably better than this. The demand is only fair.

**Rails and Track Supplies.**—The improvement noted in this department seems to have fizzled out and business is reported to be in a comatose condition. We quote as follows: Splice Bars, 1.30¢ @ 1.35¢; Spikes, 1.75¢ @ 1.80¢; Bolts are lower; Steel Links and Pins, 1.60¢ @ 1.65¢; Iron, 1.75¢ @ 1.80¢; Old Rails are lifeless at \$10 and Steel Rails are in the same condition at \$26 @ \$26.50.

**Pig Lead.**—At 3.20¢ the market seems to be firmly held. Sales of several hundred tons have been reported at this price, which now seems to be the lowest at which this metal can be bought.

Stocks are light and a gradual improvement in prices is anticipated.

**Spelter.**—Nearly if not quite 50% of the producing capacity of the country is shut down, and yet the demand is not sufficient to hold up prices. The market has eased off to 330¢, but as intimated in our last report, the downward movement was done with the view of closing down additional furnaces. That it has had this effect is evidenced by the fact that several furnaces have closed down since our last report. The market is feverish at 330¢, and is in condition to quickly respond to either good or bad influences. Closing sales to-day were made at 332½¢.

Under date of April 2 the E. E. Souther Iron Company, St. Louis, announce that they will hereafter conduct the business heretofore known as E. E. Souther & Bro. The officers of the new company are: President, E. E. Souther; vice-president, F. E. Codding; secretary, A. G. Souther; treasurer, W. M. Scudder. The firm of E. E. Souther & Bro. have been long and favorably known throughout the entire West, and the change in name will be a change in name only; the personnel and general method of doing business will remain the same as heretofore.

The Paddock-Hawley Iron Company, St. Louis, Mo., have closed arrangements to move into more commodious quarters. It will be remembered that in November last their store and warehouses were almost totally destroyed by fire. Since that time they have occupied temporary quarters at 515 and 517 North Main street. The new building which they will occupy as soon as completed will be six stories in height exclusive of the basement, and will be built strong and substantial throughout. A novelty will be seen in a projecting base of Boiler Iron, which will be 4 feet high, thus preventing the marring of the lower portion of the building by the stocking up of goods, &c. The entire business of the company will be concentrated under one roof, and with the unexcelled shipping facilities which they will enjoy in their new quarters, they will be able to make very prompt shipments. The offices of the company will be fitted up with all the modern conveniences, and in fact the entire building will be modern in its construction, finish and detail.

The Springfield Iron Company, Springfield, Ill., whose local office is in charge of Albert Waycott, sales agent, have moved their St. Louis offices from the Laclede Building to a more commodious suit in the Union Trust Building.

## Louisville.

LOUISVILLE, Ky., April 16, 1894

There has been some buying for delivery throughout the year, and the prices made have been as low as at any time during the depression. For the orders placed there was keen competition, and No. 2 Foundry has sold as low as \$7, Birmingham, deliverable throughout the year, and even this price is reported shaded in some instances 15¢ per ton. Consumers realize that the present moment is a desirable one for them to purchase, as they feel the price of Iron is extremely low, and consider it wise to take advantage of same. Some of the leading furnaces have stated that they preferred not to bid on contracts for long delivery at the present time,

as they felt prices were too demoralized, but there is enough Iron offered, so that the withdrawal of a few companies does not prevent consumers obtaining all the Iron they want at present prices. It is quite generally agreed that furnaces cannot afford to sell at the present moment at figures now ruling, and in the territory south of the Ohio River, St. Louis and West there is no reason why demoralization should exist when this territory draws its entire supply from the South, and can well afford to pay more for Iron, and would do so if it were not for the extreme rivalry between Southern furnaces, which with a little trouble could be avoided. We quote for cash, f.o.b. cars Louisville:

Southern Coke, No. 1 Foundry.	\$10.50	@	\$10.75
Southern Coke, No. 2 Foundry.	9.00	@	9.50
Southern Coke, No. 3 Foundry.	8.50	@	8.75
Southern Coke, Gray Forge...	8.00	@	8.50
Southern Charcoal, No. 1 Foundry...	12.50	@	13.50
Southern Car Wheel.....	15.00	@	15.50

## Financial.

The most important financial feature of the week under review has been the resumption of gold exports, which were made by last Saturday's steamers to the extent of \$4,000,000. The gold was sent mainly to Paris, where it is presumably required in view of the pending French Government loan. These exports have not caused any uneasiness in financial circles, nor is it believed that the movement will attain any large proportions. No gold was shipped by Wednesday's steamships, but it is announced that \$500,000 of the metal is engaged for shipment next Saturday. As a matter of fact there is no profit in exporting gold at present rates, and the late shipments are generally attributed to the fact that the plethora of money here and the difficulty of lending it render the local bankers unwilling to draw bills on London because they can find no use for the proceeds. This causes such a scarcity of bills that remitters were forced to send over money. The total gold shipments for the year to date have aggregated \$12,500,000, a sum that is much smaller than the movement in the same period for the last three or four years. Consequently, it is pointed out, the present efflux need excite no alarm, particularly when the banks are so overladen with funds.

Business in general does not show the decided improvement that was looked for awhile ago. This may be partly due to the severe weather of last week, but tariff uncertainties are, beyond doubt, mainly responsible for the slow growth of activity. Merchants expect a large increase in trade as soon as a tariff law is passed, no matter what the duties may be fixed at. It is the difficulty of figuring on a basis of cost that prevents the giving of orders in many lines of trade and restrains business. Some comfort is taken from the announcement, made on Tuesday, that the Senate had agreed to close general debate on the tariff bill next Tuesday evening, and to begin its reading and discussion by paragraphs on Wednesday next. Yet people are found who assert that the passage of the bill in any form will not be seen in the present session of Congress. This uncertainty it is which is keeping back the development of what should be an extremely active business season, in view of the shortness of stocks, and the pending enterprises, which, throughout the country, are only awaiting a revival of trade. Strikes have been a depressing feature of the week, which has had a bad effect.

Railroad earnings fall, as yet, to show any decided improvement, and bank clearings throughout the country reflect but little encouragement. The latter for the second week of April were 26.9% smaller than last year, against 19.5% in the first week. Meanwhile freight tonnage on the main lines of railroad is reported to be increasing, and this should be exhibited in the reports of earnings in the weeks to come, provided any extended spread of strikes does not again interfere.

According to the *Financial Chronicle* railroad gross earnings for March in comparison with last year showed no improvement over the earnings of the months preceding. The losses are heavy both in ratio and amount, and extend to practically all sections of the country and to all classes of roads. It is noticeable that a few lines which previously had escaped heavy decreases in earnings this time have done as poorly as the rest. In a word, everything goes to show that the business conditions have been extremely and generally unfavorable. In the aggregate the loss on the roads contributing returns reaches \$5,877,414, or 13.05%. In February the loss on substantially the same roads was \$4,654,203, or 12.54%; in January it was \$4,819,853, or 12.25% and in December \$6,474,337, or 13.83%. Both the percentage and the amount of decrease, it will be observed, are heavier than for either January or February, though in percentage the deviation is not very great. This is very evident from the results for the quarter ending with March, for which period the decrease is 12.78%, as against 13.05% for March standing by itself.

The weekly statement of the Associated Banks of New York shows that the accumulation of idle funds still goes on. The surplus reserve increased \$3,025, and now stands at nearly \$81,000,000. The banks now hold \$100,000,000 more than a year ago, while the increase in circulation in the interval has been only \$10,000,000. Loans expanded \$6,500,000, but deposits at the same time increased \$9,000,000. The increase of \$2,284,000 lawful money is explained by shipments from the interior, the country banks being unable to use their deposits owing to lack of demand for idle capital. The difficulty of lending money is so great that large amounts are said to have been borrowed within the past few days at 3% for a whole year in mixed stock collateral. Money is still easy at 1% on call. Time money is unchanged at 2% for 30 to 60 days; 2½% for 90 days, and 3% for longer terms. The supply of funds is largely in excess of demand. The demand for commercial paper of the first class continues brisk, but a light supply of good material prevents much activity in this market. The ruling rates are 3% @ 3½% for indorsed bills receivable, 3½% @ 4½% for choice single names, and 4½% @ 5½% for names not so well known.

Business on the Stock Exchange has been irregular. The market closed last Saturday dull and lifeless, but firm, after a week of little interest, and with some decline from the level reached in the March advance in prices. On Friday Atchison developed unusual activity and buoyancy, consequent on news of the formation of a strong Reorganization Committee for that great system. Sugar Refineries stock also took an upward turn of nearly 3 points, ostensibly on rumors of an annual statement and declaration of a dividend by the company. The stock was equally strong and active on Saturday, when a further

rise of  $3\frac{1}{2}\%$  took place, the dealings in Sugar certificates being larger than in all the other stocks put together. The stock has been quiet this week. Chicago Gas was the feature of Monday's trading, when it almost monopolized attention, some 84,000 shares being dealt in, the stock ending with a gain of  $2\frac{1}{2}$  points. Talk of impending war of rates and reports of coming strikes had a depressing effect on railroad stocks early in the current week. Most of these issues, particularly the Granger roads, experienced fraction losses. St. Paul was especially active on selling orders. Nevertheless the market closed firm with a strong undertone. The following list shows the fluctuations of the more active stocks during the week, with closing prices April 18:

	High- est.	Low- est.	Closing est.	Apr. 18.
Am. Sugar Ref.	99 $\frac{1}{4}$	92 $\frac{1}{4}$	97 $\frac{1}{2}$	
Atchison, T. & S. F.	16	14 $\frac{1}{2}$	15	
Chicago Gas	66 $\frac{1}{2}$	62 $\frac{1}{2}$	66 $\frac{1}{2}$	
Chic., B. & Q.	82 $\frac{1}{2}$	80 $\frac{1}{2}$	81 $\frac{1}{2}$	
Chic., Mil. & St. Paul	64 $\frac{1}{2}$	62	62 $\frac{1}{2}$	
Del. & Hudson	142 $\frac{1}{2}$	139 $\frac{1}{2}$	139 $\frac{1}{2}$	
Gen. Electric	42 $\frac{1}{2}$	40 $\frac{1}{2}$	40 $\frac{1}{2}$	
Manhattan	127 $\frac{1}{2}$	125 $\frac{1}{2}$	126	
Missouri Pacific	31 $\frac{1}{2}$	29	29 $\frac{1}{2}$	
National Lead, Common	40 $\frac{1}{2}$	39 $\frac{1}{2}$	39 $\frac{1}{2}$	
N. Y., L. E. & Western	17 $\frac{1}{2}$	15 $\frac{1}{2}$	16 $\frac{1}{2}$	
Philadelphia & Reading	21 $\frac{1}{2}$	20	20 $\frac{1}{2}$	
Richmond & West Pt.				
Term'l	9 $\frac{1}{2}$	9	9	
St. Paul & Omaha	40 $\frac{1}{2}$	39 $\frac{1}{2}$	39 $\frac{1}{2}$	
Union Pacific	21 $\frac{1}{2}$	19 $\frac{1}{2}$	19 $\frac{1}{2}$	
Western Union	85	83 $\frac{1}{2}$	84 $\frac{1}{2}$	

The railway and miscellaneous bond market maintains its strength. Prices are generally higher. Government bonds are unchanged and steady. A sale on call was noted on Tuesday of \$50,000 4s, registered, at 114 $\frac{1}{2}$ . The closing quotations were as follows:

	Bid.	Asked.
2's, 1891, registered	96	...
4's, registered	114	114 $\frac{1}{2}$
4's, coupon	114 $\frac{1}{2}$	114 $\frac{1}{2}$
5's, registered	117 $\frac{1}{2}$	117 $\frac{1}{2}$
5's, coupon	118 $\frac{1}{2}$	118 $\frac{1}{2}$

Sterling exchange has been quiet and firm, owing to a limited supply of bills. Unless the supply increases bankers look for further shipments of gold on Saturday. Actual business was done on Wednesday at \$4.87 for 60 days, \$4.88 $\frac{1}{2}$  for demand, \$4.88 $\frac{1}{2}$  for cables and \$4.86 $\frac{1}{2}$  for commercial.

Domestic exchange on New York is quoted as follows: New Orleans, commercial 100 premium, bank 150 premium; Charleston, buying par, selling  $\frac{1}{2}$  premium; San Francisco, sight 15, telegraph 20 premium; Savannah, buying par, selling  $\frac{1}{2}$  premium; Chicago, 65 premium; St. Louis, 80 premium.

Bar Silver has advanced to 28 $\frac{1}{2}$  pence  $\frac{1}{2}$  ounce in London, and 63 $\frac{1}{2}$  nominal  $\frac{1}{2}$  ounce in New York. Shipments of the metal amounting to 520,000 ounces have been made to Europe during the week.

Wheat dropped several points last week on the announcement that the damage done to the crops by the late storm was not nearly so great as was at first reported. Exports from both coasts have been considerably below the average, while Western receipts are large and nearly up to the normal volume. Corn is stronger, on a decrease in interior receipts, although these continue large. Some large purchases of corn by export houses are reported. Cotton has declined on the collapse of a fabric of unfounded reports reared in order to lift prices. Receipts from plantations for the first half of April have been rather larger than last year, and exports somewhat smaller, as well as the takings of Northern spinners. The crop of 1883 is estimated at 7,300,000 bales.

## Metal Market.

**Copper.**—The following statement appears in the circular of James Lewis & Sons, dated Liverpool, April 2: "In New York a considerable quantity of Lake Copper has been sold at 9 $\frac{1}{2}$ ¢  $\frac{1}{2}$  lb. For export to Europe Ingot Copper offers at the equivalent of about 8 85¢  $\frac{1}{2}$  lb." New York sales agents and exporters question the accuracy of the last statement, claiming that export sales of Lake Superior Ingot have not been made at less than 9 45¢, and that common Arizona Pig Copper realized the equivalent of 8.65¢. Business on home account has been larger the past week. Liberal contracts were made with consumers at 9 $\frac{1}{2}$ ¢ for Lake Ingot, deliveries running up to July. Supplies of Montana product have been cut off to some extent by the Great Northern Railroad strike, but Arizona product has come forward in sufficient quantity to meet the demand and orders for the cheaper varieties of Copper are being filled at old prices, say 9 $\frac{1}{2}$ ¢ @ 9 $\frac{1}{2}$ ¢ for Electrolytic and 9¢ @ 9 $\frac{1}{2}$ ¢ for ordinary casting brands.

**Pig Tin.**—From the prices that ruled at the date of last week's report there has been an advance of about 0.25¢  $\frac{1}{2}$  lb., 19.75¢ having been realized for 5-ton lots of Straits Tin for delivery before the end of the current month. The rise was due chiefly to strong advices from London on the 16th inst., but facilitated by the fact that the stock in New York is not only moderate but the holdings so scattered that the market is extremely sensitive to London manipulations. Subsequently values here went a fraction lower, for no other visible cause than a reaction in the foreign market. The movements of prices in either direction, as a matter of fact, seemed due to foreign influence and the surface appearances are that this will continue to be the case until enough stock is diverted to American ports to place New York in the position of being something more than merely the follower of a London leader. There is little speculation here at present, and hardly any tendency in that direction. The shape of the market is not attractive. Straits shipments during the first half of the month were quite heavy, including 800 tons to Great Britain and America and 475 tons to the Continent, against a total of 775 tons in the corresponding period last year. Sales were made Wednesday on the exchange to the extent of 25 tons spot at 19.60¢ and 10 tons April delivery at 19.55¢ @ 19.60¢. Toward the close 19.60¢ was bid for spot and 19.62 $\frac{1}{2}$ ¢ for April delivery.

**Pig Lead.**—The market has been very steady at the higher range of prices established last week. Nearly, or quite, 1000 tons have been placed in round lots, at or about 3.45¢, by local brokers, and a number of single car-loads were sold at 3.47 $\frac{1}{2}$ ¢. Meanwhile, there was some effort to force prices lower, chiefly by one or two local firms, but the effort was fruitless, since other than Eastern buyers not only purchased quite freely, but had brokers on the alert for all Lead offered at less than 3.45¢ for delivery this month or next. The buying during the week has been chiefly for jobbers and consumers. Very few purchases were made for speculative account.

**Spelter.**—There are some signs of a steadier turn to the market. The best evidence of this is that no response is made to requests for firm offers of the poorest Western brands at 3.55¢, de-

livered here or at common point. The tests made indicate that 3 60¢ is the very bottom price, and that sellers at less than 3 65¢ are the exception. No business of importance has been effected here, but sales of moderate sized lots make a better showing than they have for some time past.

**Antimony.**—Fair sales have been made and the market is quite steady at about 8 $\frac{1}{2}$ ¢ @ 8 $\frac{1}{2}$ ¢ for Hallett's, 10¢ @ 10 $\frac{1}{2}$ ¢ for Cookson's, and corresponding prices for minor brands.

**Nickel.**—Little change has taken place, purchases being of routine character and fair, all told. Prices range between 40¢ and 45¢, as to size of lot.

**Tin Plate.**—Little if any improvement has been experienced in sales of spot stock or in orders for future deliveries. In fact, the market remains exceptionally quiet for this season of the year. Prices are still uneven and more or less irregular, despite the fact that stocks here are considerably below the average and that foreign manufacturers are seriously considering a reduction of output to offset the bearing of slow sales. For stock on the spot we quote as follows: Coke Tins—Penlan grade IC, 14 x 20, \$5.10; J. B. grade, full weight, \$5.20; light weights, \$4.80 for 100 lb, \$4.70 for 95 lb, \$4.60 for 90 lb; Bessemer full weight, \$5.20; light weights, \$4.75 @ \$4.80 for 100 lb, \$4.65 @ \$4.70 for 95 lb, \$4.55 for 90 lb. Siemens Steel scarce. Stamping Plates—Bessemer Steel, Coke finish, IC basis, \$5.40; Siemens Steel, IC basis, \$5.50; IX basis, \$6.60. Charcoals—Melyn grade, IC, \$6.25; Crosses, \$7.75; Allaway grade, IC, \$5.40; Crosses, \$6.50; Grange grade, IC, \$5.50; Crosses, \$6.60. Charcoal Ternes—Worcester, 14 x 20, \$5.70; do., 20 x 28, \$11.25; M. F., 14 x 20, \$7.20; do., 20 x 28, \$14.50; D. R. D. grade, 14 x 20, \$5; do., 20 x 28, \$9.75; Alyn grade, 14 x 20, \$5.20; do., 20 x 28, \$10.25 @ \$10.40. Wasters—S. T. P. grade, 14 x 20, \$4.60; do., 20 x 28, \$9; Abercarme grade, 14 x 20, \$4.50; do., 20 x 28, scarce.

The monthly production of Copper in the United States has been as follows, the first column giving the aggregate returns from the reporting mines, which include the principal Lake, Montana and Arizona producers; the second being the metal from pyrites and from a number of smaller outside sources, being estimated:

	American Product.		
	Reporting mines.	Outside sources.	Total.
	Gross tons.	Gross tons.	Gross tons.
Second half 1892	59,239	6,287	65,526
First half 1893	62,470	6,478	68,938
Second half 1893	67,290	6,253	73,542
Total 1893	129,760	12,730	142,490
1894			
January	10,832	1,340	12,172
February	10,245	1,340	11,585
March	13,759	1,340	15,099

The product of the foreign reporting mines and the United States exports was as follows:

	Foreign reporting mines.	United States exports.
	Gross tons.	Gross tons.
Second half 1892	39,655	17,980
First half 1893	41,048	20,361
Second half 1893	40,647	60,031
Total 1893	81,495	80,392
1894		
January	6,145	7,717
February	7,217	5,590
March	6,922	7,137

John Stanton, representing the Atlantic, Central, Wolverine Copper, and

Allouez Mining Companies, has removed his offices to 11 and 13 William street, New York.

## New York.

Office of *The Iron Age*, 95-102 Reade street, NEW YORK, April 18, 1894.

**Pig Iron.**—As yet no intimations have come to sales agents of Southern furnaces in the district to withdraw from the market as the result of the troubles in the Birmingham coal mines. On the contrary, prices lower than ever have been made during the last week. Sales of Western Pennsylvania Irons are being pushed in this territory and it is reported that they are going right into the foundries in the Lehigh Valley. One point which is attracting some attention among sellers is the rapid decline during the past year in the proportion of No. 1 Iron which founders are using in their mixtures. Some of them have learned to get along without it altogether. We quote standard brands \$12.50 @ \$13.25 for No. 1; \$11.50 @ \$12.25 for No. 2; \$10.75 @ \$11 for Gray Forge, at tidewater. Southern Iron, same delivery, \$12 @ \$12.50 for No. 1; \$11 @ \$11.50 for No. 2; \$10.50 @ \$11 for No. 3; \$10.75 @ \$11.25 for No. 2 Soft, and \$11.25 @ \$11.50 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is \$10.25 @ \$10.50.

**Cast Pipe.**—The East River Gas Company have placed about 3500 to 4000 tons of Pipe, Radford, Chattanooga and McNeil participating in the order.

**Ferromanganese and Spiegeleisen.**—A lot of about 100 tons of foreign Ferromanganese from stock has been placed with a Philadelphia mill. It is reported also that an Eastern mill has purchased a moderate lot of domestic Spiegeleisen. We continue to quote domestic Ferromanganese \$51 @ \$51.50, delivered, and foreign Spiegeleisen nominally \$21 @ \$22 for 10 %, and \$24 @ \$25 for 20 %, ex-ship.

**Billets and Rods.**—Negotiations are pending for a round lot of Billets for a Rod mill in Eastern Pennsylvania. We quote \$17.50 @ \$18 for domestic, and nominally \$27 @ \$27.50 for foreign. Domestic Wire Rods are nominally \$26.50 @ \$27.50, and foreign \$39 @ \$40, tidewater.

**Steel Rails.**—There are rumors afloat that a Southern road has placed 22,000 tons of standard Rails. Demoralization continues in Light Rails, which are quoted \$22 @ \$25, according to section, at tidewater. Competition in Girder Rails is very fierce, and very low mill prices are reported. We quote \$21 @ \$23 at mill. We note a sale of about 3500 tons to the Brooklyn road.

**Track Material.**—We quote as follows for small lots: Spikes, 1.60 @ 1.80¢; Fish Plates, 1.20 @ 1.40¢; Track Bolts, Square Nuts, 2¢ @ 2.10¢, and Hexagon Nuts, 2.20 @ 2.30¢, delivered.

**Manufactured Iron and Steel.**—The Coffee Exchange building has been taken by a Philadelphia firm of contractors. A local architectural works has closed for the work on a smaller building, the Jones, at Fourth and Greene streets. From Philadelphia comes the report that the Fidelity Building has been taken by a Delaware concern. A small job has also been given out in Boston, the bulk of the Beams being 20 inch. Little is being done in Plates, while in Bars transactions are limited, the low prices named failing to tempt buyers. Quite a number of good orders

are being taken for Cotton Ties. Negotiations are pending for a large block of Hoops. We quote: Beams up to 15-inch, 1.30¢ @ 1.50¢, for round lots; Angles, 1.20¢ @ 1.35¢; Universal Mill Plates, 1.15¢ @ 1.35¢; Tees, 1.40¢ @ 1.60¢; Channels, 1.80¢ @ 1.50¢, on dock. Steel Plates are 1.20¢ @ 1.30¢ for Taulk; 1.35¢ @ 1.40¢ for Shell; 1.55¢ @ 1.60¢ for Flange, and 1.75¢ @ 2¢ for Fire Box, and 2¢ @ 2.25¢ for Locomotive Fire Box, on dock; Refined Bars are 1.20¢ @ 1.9¢, on dock, and Common 1.05¢ @ 1.20¢; Soft Steel Bars are 1.15¢ @ 1.30¢; Scrap Axles are quotable at 1.35¢ @ 1.50¢, delivered; Steel Axles, 1.35¢ @ 1.50¢, and Links and Pins, 1.40¢ @ 1.60¢; Steel Hoops, 1.40¢ @ 1.50¢, delivered; Cotton Ties, 65¢ @ 70¢ @ 45 lb bundle, at mill; Machinery Steel, 1.20¢ @ 1.40¢; Toe Calk, 1.80¢ @ 1.90¢, and Sleigh Shoe, 1.60¢ @ 1.75¢, delivered.

**Old Material.**—An order for 2000 tons of Old Steel Rails for shipment to Italy has been partly filled at private terms.

## British Iron and Metal Markets.

[Special Cable Dispatch to *The Iron Age*.  
LONDON, WEDNESDAY, April 18, 1894.

The market for Pig Tin has been irregular, but upon the whole prices have averaged higher. Straits went to as low as £69. 15/ for prompts, advanced to £70. 5/ and reached to £70. The stronger tone was due in part to better market for Silver, but more buying for American account and some increase of outside speculative interest helped to stiffen the market. Purchases for outside account were, however, rather small. Supplies are firmly held although quite large, and Cash Tin is frequently quite scarce on the open market. At the close the tone was easier with £69. 10/ quoted for prompts and £70. 10/ for three months' futures.

In prices of Merchant Bar Copper there has been a decline of about 10 %. Sales were made at as low as £40.2/6 for prompts. The downward movement is attributable chiefly to realization by tired holders, but free selling by importers and dealers had adverse influence, and weak reports from America not only caused speculative holders to unload, but restrained buyers. Stocks increased 537 tons during the first half of the month and the visible supply increased to the extent of 137 tons. At the close the market was flat. Merchant Bars were quoted at £40.2/6 for prompts and £40.12/6 for three months' futures. Best selected English is about £43.

Tin Plate business has been of very fair volume, but the market shows soft tone. At the quarterly meetings prices ruled in buyer's favor. Fair orders were placed for 10 x 10 Siemens Cokes at 3 pence decline, and for Squares at 3½ pence under market quotations. Liverpool quotations for Plates were as follows:

IC Charcoal, Alloway grade..... 12/ @ 12/6  
IC Bessemer Steel, Coke finish..... 11/3 @ 11/6  
IC Siemens..... 11/8 @ 11/8  
IC Coke, B. V. grade, 14 x 20..... Nominal  
Charcoal Terne, Dean grade..... 10/8 @ 10/8

Pig Lead business has been on a moderate scale and prices have weakened to £9. 2/6 for Soft Spanish.

Spelter is easier at £15. 2/6 for ordinary Silesian, with only a moderate business passing.

The Iron trade is without change, business being fair and the movement in prices narrow. Last sales of warrants were at 42/10 for Scotch, 36/ for Cleveland and 45/2½ for Hematite.

## CONTENTS.

	PAGE.
New Type of Vertical Compound Engine. Illustrated.....	741
Science in Steel Manufacture .....	744
Combined Punch and Shears. Illus.....	744
Press Working of Sheet Metals.—I. Illus	745
An Open Letter on Profit Sharing.....	747
The Flather Taper Attachment for Lathes. Illustrated.....	748
The Card Index.....	748
Excelsior Anchor Plate and Post Cap. Illustrated .....	750
The Hawdon and Howson Blast Furnace. Illustrated .....	750
The Garvin Eight-Spindle Automatic Drill. Illustrated.....	751
The Link Belt Machinery Company .....	751
The Week.....	752
Cast Iron Pipe Rates .....	752
The Otis Steel Company .....	752
Editorials:	
A Review of Iron and Steel Prices.....	753
Testing Structural Material.....	753
Finished Iron and Steel in Great Britain .....	753
Correspondence .....	754
Washington News.....	754
Obituary.....	755
Treasury Decisions .....	755
Open Hearth Steel in Great Britain .....	755
The Pennsylvania Steel Company .....	756
New Publications.....	756
Manufacturing :	
Iron and Steel.....	757
Machinery.....	757
Hardware.....	758
Miscellaneous .....	758
The Iron and Metal Trades :	
Philadelphia .....	759
Pittsburgh .....	760
Cincinnati .....	760
Chicago .....	761
St. Louis .....	761
Louisville .....	762
Financial .....	762
Metal Market .....	763
New York .....	764
British Iron and Metal Markets .....	764
Hardware	
Condition of Trade .....	765
Notes on Prices .....	766
The Early Manufacture of Hardware in New England .....	767
The Question from South Dakota in Regard to Delivery of Goods and Cash Discount .....	767
Representative Hardwaremen of New York .....	768
Requests for Price-Lists, Quotations, &c .....	768
The Question in Regard to Settlement of Account .....	768
Improvements in Family Spring Scales .....	769
Mail Orders .....	769
Manufacturers and Jobbers .....	769
Trade Items .....	770
Made in Germany .....	771
Window Display .....	771
The Warren Shelving. Illustrated .....	771
Wholesale vs. Retail Experience .....	773
Manufacturers' Association of Kings and Queens Counties .....	774
Catalogues, Price-Lists, &c., for the Hardware Club of New York .....	774
Purchase of the Bransford Lock Works by the Yale & Towne Mfg. Company .....	774
Price-Lists, Circulars, &c .....	774
It is Reported .....	775
Paints and Colors .....	776
The Palmer Trouser Guard. Illus .....	776
Hamblin & Russell's Hose Mender. Ill. ....	777
Philadelphia Lawn Mower Fender. Ill. ....	777
Barrel Pan for Oil Barrels. Illus .....	777
The Gurney Removable Ice Compartment. Illustrated .....	777
Lu-mi-nim Bicycles. Illustrated .....	777
Escutcheon for Jackson Latches. Ill. ....	778
Yates' Astringent Lacquer .....	778
Redfield's Towel Holder. Illustrated .....	778
Graphite Cycle Lubricant .....	778
Bicycle Pumps .....	778
Ice Pick .....	778
Almond and Peanut Sheller. Illus .....	778
Current Hardware Prices .....	779
Current Metal Prices .....	780

# HARDWARE.

## Condition of Trade.

REPORTS indicate that trade in the different parts of the country varies considerably in tone and volume. A general feature of it is its unevenness, the orders of one day or week being relatively large and encouraging, and those of the next more or less disappointing. From several sections there is evidence of a steady improvement in the condition of things, and the indications point toward a gradual movement in this direction. The small trade are buying somewhat more freely notwithstanding the complaints that are made in regard to this matter from some markets, as more fully referred to in some of the following reports. It is also a significant fact that some of the representatives of large Western houses have recently been placing orders for future delivery, and express the confidence that before very long there must be a marked increase in the volume of trade. In the matter of prices there is little to add to what was said last week, the market being devoid of strength in many lines, with a tendency toward lower quotations. Collections give little ground for complaint.

### Chicago.

(By Telegraph.)

A little better demand is reported for Shelf Hardware and also for roofing and tinner's materials from the general country trade. House furnishing goods and tinware experienced a little increase last week, but the gain then felt has been lost by this time and trade has relapsed into its former dullness. Copper goods have advanced slightly in consequence of the increased price placed on sheet copper. The improvement in this line of business is, however, more than counterbalanced by the lower rates made on staple goods. The prices named by jobbers on the latter have been modified considerably during the past week, but greater concessions have been made to the city than to the country trade. Jobbers appear to be competing most vigorously for city business, although it is only a small proportion of the trade which they handle. Heavy Hardware jobbers have felt no improvement in their demand, but report their customers buying very sparingly and keeping stocks down as low as possible. Wagon builders are doing considerably less than last month and appear to be afraid

to make up stock to any extent. Collections are fair.

### St. Louis.

(By Telegraph.)

The changeable weather which has characterized this locality during the past two weeks continues to have a depressing influence on the demand for Hardware. Shelf goods are particularly dull, and sales are running behind last year. The Southern trade is referred to by jobbers as being very backward, and unless the demand sets in very soon the trade from this section will not compare very favorably with last year. Prices are weak in nearly all lines, and advances in goods are not now heard of. Wire Nails and Barb Wire seem to be singled out as leaders, and some of the prices made for these commodities seem to indicate that it is tonnage and not profits the manufacturers are after. Builders' Hardware and supplies are moving pretty freely. Retailers cannot be induced to stock up, and continue the policy of buying as their needs require. Collections are good.

### Cleveland.

THE W. BINGHAM COMPANY.—We are having an unusually good trade for this time of the year, especially in view of the disturbances that have been going on throughout the country. Merchants are buying light, and while the number of orders exceeds that of last year the aggregate is not so great. If our friends in Washington would only make up their minds to do something or nothing it would tend to give more confidence to buyers and we think the orders would be largely increased. There is a brisk demand for Wire Cloth, Poultry Netting, Lawn Mowers, Steel Goods, Ice Cream Freezers—in fact, for all season goods or those that are likely to be used within the next 60 days. As the season is a little in advance of last year, on account of the open weather we are having, merchants are anxious to receive goods promptly and it looks as though the limited stocks in the market would soon be consumed. The outlook for the future is much brighter than at the first of the year.

### New Orleans.

A. BALDWIN & Co.—There has been no change in the situation in this market. Business still remains very quiet. We were in hopes that as the weather cleared up somewhat there would be an increase in inquiries and purchases of goods. Even the slight activity which was shown in the builders' line has fallen off, and everybody seems to be waiting for further developments. We cannot see any very bright prospects of an improvement in the situation for some little while.

### Baltimore.

CARLIN & FULTON.—Business continues very quiet, and the extraordinary weather of this week has had anything but a beneficial effect, many sections of the State being now covered with snow. The destruction of the fruit will of course interfere greatly with the sales of Preserving Kettles, Cherry Seeders and Peach Parers, and the injury to the early vegetables is very disheartening to the farmer and will of course have its effect upon the country stores. Trade cannot be stimulated by low prices, for there is no tendency to speculate, and purchases are made mostly for immediate wants.

With rare exceptions collections are good, and financially we think the trade is in as good condition as at any previous time.

This city is spending large amounts of money for street paving and other municipal improvements, to the great delight of the laboring man, though the taxpayer groans over increased assessments as well as larger rates.

We are living in hopes that at some day our national representatives will realize the fact that the country is tired of the endless discussion of the tariff bill and demands action. The trade organizations throughout the country should bring every possible influence to bear upon Congress to decide the matter one way or the other, just so that every branch of business and every consumer may know what to do. The trade of last fall was killed through the inaction of the Senate, the trade of this spring has amounted to nothing from the same cause, and if this same apathy or indifference to the interests of the entire country continues the same results will happen during the coming fall.

### Portland, Oregon.

CORBETT, FAILING & ROBERTSON.—The opening week of the month of April is a most decided improvement, as respects the Hardware trade. Not that the volume of business was swelled to old time proportions—that is not to be expected this season. But it is apparent that there is a very considerable increase, based on a healthy demand for actual consumption. Collections, too, are improving, and we jobbers are comforted by the thought that our customers are not doing all their spring trade on their books.

We still read of snow storms and blizzards in the East, but our spring, although a damp one, has not been a bad one for the farmer.

We note the suggestion of the W. Bingham Company in your issue of the 5th inst., and are disposed to give it our indorsement. When the last arrangement of the Wire Nail schedule was published, we were all given to understand and hoped that the effect would be to eliminate the "average" nuisance, but the result has been otherwise. The present system tends to the demoralization of stocks, as well as of

prices. When a merchant, to get a very low base price, gives an order for a high average, it is almost certain that his next order must be for a lower average and a higher base; otherwise he continues to accumulate high price sizes in excess of his requirements, and to his own injury. It certainly seems to us that price and card can be so arranged that a customer can place an order for any assortment at the base price, without any question as to "average." This is the way we have to do business with our own customers, and it is a source of more than a little vexation that whereas our selling price is often based on the cost of a "high average" invoice we cannot avail ourselves of the mill system, and make a profit on classification that we could not on price.

#### Omaha.

LEE-CLARKE-ANDREESEN HARDWARE COMPANY.—There has been but little change in the condition of the Omaha jobbing Hardware trade during the past two weeks, although as a general thing moderate gains have been scored. The improvement that has been noticeable since early March shows no symptoms of weakness.

Necessary and welcome rains have visited all parts of the West within the past week, doing incalculable benefit to the soil just in time to prevent serious damage to the fall grain.

Bright spring weather has not yet fairly set in, and when it does it is expected that trade will liven up considerably. But even with the most favorable conditions, there will still be a tendency by retail dealers to buy conservatively and in small orders. Mere prospects will not have the same effect as in previous seasons, and in all probability the volume of trade will not reach the top notch again until after an abundant crop is harvested.

#### Philadelphia.

SUPPLEE HARDWARE COMPANY.—During the last week the further anticipation of improved trade was materially interfered with, owing to the prevalence of storms and the return of cold weather, which temporarily restricted trade, although this week opens with a considerably brighter feeling, and the lateness in trade must have its effect upon increased orders in the near future, and in this respect the general outlook is hopeful.

Prices remain without any material change as a rule, although Cut Tacks have advanced and show a big jump in price, and Green and Black Wire Cloth are scarce, with an advance of about 10 per cent.

The output of Iron during the last two weeks is rather an encouraging feature, and quite a number of industrial enterprises adjacent to our city have made partial resumption of their works.

Collections have been somewhat retarded, owing to the temporarily inclement weather.

Failures, while they show an increase over the year 1893, are gradually decreasing.

#### St. Paul.

FARWELL, OZMUN, KIRK & Co.—Trade is fully equal to expectations. The weather has been somewhat wet for seeding, but the delay thus induced is not serious, inasmuch as the season is still early, and the outlook for the future may be referred to as satisfactory. Collections are as good as can be expected.

#### Notes on Prices.

**Wire Nails.**—There appears to be something of a falling off in the volume of business, but the manufacturers are in receipt of many orders and are fully occupied. Some of these orders are from the large houses, but many of them are for comparatively small lots, the aggregate of the business, however, being large. Quotations are the same as last week, 95 cents at mill being a representative price, which is shaded only in the case of especially large and important orders. Small lots from store in New York are held at \$1.20 to \$1.25.

*Chicago, by Telegraph.*—The advantages promised in February from the closer alliance made by Wire Nail manufacturers have all been lost, and the business in this branch has relapsed to its old condition. A prominent manufacturer says that, himself included, the manufacturers of Wire Nails are the biggest fools in the Iron and Steel trades. They have permitted themselves to flitter away one of the best opportunities they ever had to conduct a steady spring trade at a reasonably fair margin. The current demand is light, and yet the factories seem to be in possession of sufficient orders to enable them to run for the whole of this month and perhaps into the next. Their stocks are under the average held at this time of the year, and whenever specifications are sent in they are followed up promptly by telegrams if immediate shipments are not made. The trade, therefore, ought to be in good condition and prices ought to be maintained. Factory quotations are still about \$1.05, Chicago, but with concessions on good sized quantities, while small lots from stock are selling at \$1.15 to the country trade.

**Cut Nails.**—It is evident that the Eastern manufacturers are feeling more than for a long time the effect of Western competition, and within the past week or two some Western mills which have heretofore held aloof have been making quotations in Eastern markets. The price of Nails delivered in New York is 95 cents to \$1 base. Small lots from store in New York are regularly quoted at \$1.10 to \$1.15.

*Chicago, by Telegraph.*—The Steel Cut Nail manufacturers report a smaller volume of business, but they are still able to pick up enough orders to keep their works in operation. Prices are a little weaker, and may now be quoted at 95 cents on 55 cent average. Jobbers are selling small lots from stock at \$1.10, but make concessions to the city trade.

**Barb Wire.**—There is a good demand for Barb Wire, but it is not so heavy as a few weeks ago. Manufacturers are, however, fully occupied with orders, and in some cases are not able to ship as rapidly as their customers would desire. Notwithstanding the volume of

business the market is showing increasing signs of weakness and concessions are made more freely than a few weeks ago. The market is represented by the following quotations on Four Point Galvanized delivered at the points named: Pittsburgh, \$2.05 @ \$2.15; Cleveland, \$2.10 @ \$2.20; Cincinnati or Allentown, \$2.15 @ \$2.25; Chicago or New York, \$2.25 @ \$2.35. There is more complaint in regard to irregularity in prices in Western markets than in the Eastern, but the effect of the concessions which are being made is quite generally felt.

*Chicago, by Telegraph.*—The excellent demand for Plain Wire is perhaps having a better influence on the Barb Wire market than the actual demand for fencing from dealers and consumers. The miscellaneous consumers of Plain Wire are taking as large quantities as usual, so that there is less disposition to sacrifice the Barb Wire end, although business in this respect has fallen off to some extent. Prices on Galvanized Barb Wire may be quoted at \$2.30 to \$2.35 for small lots from stock, with 10 cents less for carload lots.

**Curry Combs**—The American Curry Comb Company, Troy, N. Y., have issued under date of April 16 revised quotations on their extended line of Curry Combs, on which net prices are given. They also announce a new line of Eclipse Combs, to the quality and finish of which they refer. The shanks run through the handles and are riveted. It is stated that the same pattern of Comb will be furnished, if desired to meet competition, made of a cheaper quality of material and finish, the shanks not running through the handle and not being riveted.

**Combined Planter and Hoe.**—This article is being put on the market by J. R. Ayers, Petersburg, Va., who is selling it to the trade at \$7.50 per half dozen, or \$15 per dozen, net cash, f.o.b. New York or Petersburg, Va. The implement was described in our last issue.

**Cordage.**—An increased demand is reported, being apparently stimulated somewhat by the low prices ruling. The market, however, is not in any better condition as regards quotations than at our last review, inasmuch as prices, in sympathy with the decline in raw material and as a result of active competition, continue low. The market is represented by the quotation of 6 cents base on Manila, a price which a few manufacturers decline to meet, but which on the other hand has by others been slightly shaded on large and attractive orders. Sisal and New Zealand hold quite steadily at 4 cents.

**Wire Cloth Holder.**—The Wire Cloth Holder illustrated in *The Iron Age* of March 29 and manufactured by Tempel & Lasar of St. Louis, Mo., is sold at \$7 net, f. o. b. St. Louis.

**Sheet Zinc.**—Matthiessen & Hegeler Zinc Company, La Salle, Ill., issue revised discounts on Sheet Zinc under date of April 11. The price continues \$4.50 for Sheet Zinc in 600-pound casks, of the thicknesses between Nos. 9 to 15, inclusive, and of the widths between 32 to 46 inches, and of the lengths between 84 to 90 inches. The extras are also unchanged. The discounts as revised are as follows:

Discounts.	First class. 15 600-pound casks and up- ward.	Second class. 10 to 14 600- pound casks.	Third class. 5 to 9 600-pound casks.	Fourth class. Under 5 600- pound casks.
	Per cent.	Percent.	Percent.	Percent.
Special .....	11	11	11	11
Cash with order .....	3	3	3	3
Quantity .....	3	2	1	0
Totals.....	17	16	15	14

All discounts are computed straight when money accompanies the order. Quantity discount is added to special discount in all cases. If remittance is received within 10 days of date of invoice the cash discount will be only 2 per cent. instead of 3 per cent., and not computed straight. Each order is strictly subject to the quotation of the class to which it belongs.

**The Hager Hoe Bracket.**—This Bracket was described in our issue, 5th inst., as put on the market by John N. Hager, Fort Atkinson, Wis. The Brackets are sold at \$4 per doz n.

**Adjustable Bit Wrench**—A description of this article appeared in last week's *Iron Age*. The Wrench is manufactured by the Samuel C. Tatum Company, Cincinnati, Ohio. It is sold at \$2.25 per dozen, from which a discount of 25 and 10 per cent. is given to the trade.

**Combined Cutlery Case and Money Drawer**—This article was described in our last issue. It is put on the market by the Waddel Wooden Ware Works, Greenfield, Ohio, by whom it is sold at \$12.50 each.

**Glass.**—There is a continuance of the better feeling in the Glass trade which has been noticed during the past two weeks, and an increased firmness in prices. Manufacturers and jobbers have to a great extent withdrawn quotations, and in many cases have advanced prices. It is claimed that the stock of Glass in manufacturers' and jobbers' hands is less than 500,000 boxes, while the customary stock on hand at this season of the year is stated as having been 2,000,000 to 2,500,000 boxes; while efforts are usually made to increase that amount to 4,000,000 boxes or over before the shut down. The limited stock of Glass on hand and the prospect of an increased demand are the causes of stiffer prices, as it is understood that the present stock would not be sufficient to supply the demands of the trade for one month under or-

dinary circumstances. In addition to this there is reported less than two-thirds of the number pots in operation, or 1038 pots. There have been meetings held by the Glass manufacturers of Pittsburgh and of the gas belt, and while no official report of the proceedings have been published, it is understood that there is a desire for unity on the part of both. Pittsburgh quotations are given as 85 per cent. discount for

ferry boat propelled by two horses. This was my first long trip from home, never having gone further than Hartford, 15 miles from my home, before; and it was an incident to talk about and remember.

My father's foundry was furnished blast by a water wheel and a large bellows of the same type as the ordinary blacksmith bellows, only three or four times larger. The metal was melted in a large ladle in a charcoal fire, and I presume was quite a model furnace plant for that day. Hard or anthracite coal was not much used, I think, for foundry purposes until a long time after. In fact, the first anthracite coal sent from the Pennsylvania mines to the North River was in 1829, 7000 tons, and it was not much used in the city of New York for many years after. In 1834, when I first commenced my clerkship in a store at Middle-Haddam, Conn., my employer was shipping oak and hickory wood to New York, and continued to do so for the three years I remained with him, until the panic of 1837. The price of oak wood was \$6 to \$7 a cord and hickory \$7 to \$8, and when it was carried in vessels to New York, carted to the consumer's door, sawed up by the man of the saw horse and deposited in the cellar must have cost some \$12 per cord, and I suppose the user and the newspapers of that day abused the parties who furnished the wood as much as they do now the parties who furnish the coal for \$5 to \$6 per ton, put in their cellars, when 1 ton of anthracite is supposed to furnish as much heat as 2 cords of woods. The newspapers of that day, I suppose, called the producers of wood the "Wood Barons," as they now call the producers of coal the "Coal Barons."

#### The Question from South Dakota in Regard to Delivery of Goods and Cash Discount.

**F**ROM A CORRESPONDENT in Tomahawk, Wis., we have the following interesting discussion of the inquiry from a house in Watertown, S. D., which was published in *The Iron Age* April 5. It is deserving of careful perusal:

I note in *The Iron Age*, April 5, the inquiry from Watertown, S. Dak., people in relation to freight on goods sold at delivered prices. When goods are sold delivered, while it is not customary nor always practicable for the shipper to prepay freight or express, the terms of the sale imply that the cost to the purchaser must be the same as if the freight had been prepaid. If goods are sold at Chicago delivery the purchaser must get them at the same cost that he would in case they were shipped from Chicago. Consequently, if the bill is paid in ten days, subject to a cash discount of 1 per cent., that percentage may be deducted from the entire amount of the bill, and the freight, or excess over and above freight from Chicago, as the case might be, considered as part of the net cash payment.

If, however, your correspondents have in mind a case where the full time is taken on the bill (outside of the freight) a different question is raised. The cash discount is not, as sometimes supposed, interest paid by the jobber or manufacturer for use of the purchaser's money before it is due—rather a premium which he is willing to pay for the purpose of avoiding the risks and casualties incident to long terms of credit and outstanding accounts. The difference between net 30 days and 1 per cent. in ten days, if we stop to consider it, is 18½ per cent. per annum. The difference between net

60 days and 2 per cent. in ten days is  $14\frac{5}{10}$  per cent. per annum, and if it were merely a question of the use of the money it is not worth that to any business man.

In the sale of lumber and some other commodities where the freight bears a large proportion to the cost of the goods the intention is to allow the cash discount on the amount actually due the shipper after deducting freight charges, but this should be clearly stipulated in the quotation and on the bill to make it binding on the purchaser. Expense bills should in either case be promptly returned to the shipper, to enable him to make claim against the railway company for any possible error of overcharge.

### Representative Hardware-men of New York.

CHARLES S. LAWRENCE of the Lawrence Engraving Company, 88 Centre street, New York, is about publishing a souvenir, or chart, containing the portraits of 54 representative Hardwaremen of this city. Each picture is 3 x 4 inches in size, with the name of the individual, together with the name of the concern with which he is identified, underneath. This, with the title at the bottom, is all there is of printed matter. The likenesses are made by photogravure process directly from photographs. The plates will be handsomely framed and offered at \$10 each. They are suitable for a prominent position in business offices. Among the portraits are those of George H. Sargent, Mortimer C. Ogden, Peter McCarter, George Munson, W. R. Walkley, U. T. Hungerford, Charles L. Mead, Edward Bernard, Charles E. Jennings, William C. Page, John H. Graham, Charles J. Healy, Charles E. Parker, John Tiebout, Abram Quackenbush and many other representative merchants and manufacturers of New York.

### Requests for Price-Lists, Quotations, &c.

CARTER & COTTRELL HARDWARE COMPANY have bought out the business of Himebaugh & Co., 1405 Douglas street, Omaha, Neb. The company are incorporated under the laws of Nebraska, with a capital stock of \$40,000. They intend to do some jobbing business, and will be pleased to receive catalogues and price-lists from manufacturers.

HUTCHINSON LUMBER & SUPPLY COMPANY, Cordele, Ga., advise us that they are placing their orders for a complete line of Hardware and Mill Supplies for both wholesale and retail trade. Catalogues, price-lists, &c., will be of service to them in this connection.

AS ANNOUNCED in our last issue, W. H. Parkin, formerly of Cleveland, Ohio, will soon open a Hardware store at Palm Beach, Dade County, Fla. Mr. Parkin's store will be the only exclusive Hardware establishment at Palm Beach. Mr. Parkin will be glad to receive the price-lists, circulars, &c., of manufacturers.

THE REQUEST that catalogues, price-lists, &c., for the Hardware Club of

New York be sent at once to A. D. Clinch, 94 Chambers street, New York, is referred to in another column.

### The Question in Regard to Settlement of Account.

WE PRESENT additional solutions to the problem which appeared in *The Iron Age* March 29, and a number of answers to which were given in our issue of April 5. It is interesting to notice the different views of the question which are taken by our correspondents. For the convenience of our readers we reproduce the problem.

#### The Problem.

A purchases from B merchandise to the extent of \$400, terms of settlement being freight allowed to point of delivery, four months' time, or 6 per cent. discount for cash in ten days. A takes advantage of the cash discount and sends settlement as follows :

Face of invoice.....	\$400
Less 6 per cent. for cash.....	\$24
Freight.....	10 — 34

Amount of draft..... \$366

A pays the above account, believing the stock to be satisfactory, but after two months finds a defect in the execution of the order, which prevents his using the stock in his business, and returns the entire stock, receiving in exchange similar but satisfactory goods, amounting to \$500, same terms of settlement as the first lot. He again takes the cash discount. Now, the question is, what kind of settlement is necessary to balance the account justly, and how does he arrive at the amount of the draft to balance the account?

#### Solution F.

The first bill of goods was returned, and the actual amount paid by the buyer was \$376; \$366 remitted to the seller and \$10 paid for freight. This amount stands to buyer's credit on seller's ledger, and is applied on the new bill of \$500, and as the seller has virtually had the use of that money until the settlement of the second bill, it should be considered the same as a cash payment by the buyer in taking advantage of the 6 per cent. cash discount on that bill.

1893		
Jan. 17.	To cash remitted for invoice 1/15/93, afterward returned.....	\$366.00
"	To cash paid for freight invoice 1/15/93.....	10.00
Mar. 17.	To cash in settlement....	84.00
Mar. 15.	By Mdse. .... \$500.00	
	Less 6 per cent. cash disc.....	\$30
	" Freight.....	10
		— 40.00
		\$460.00 \$460.00

#### NOVICE.

March 1.	By merchandise.....	\$400.00
10.	To freight.....	\$10.00
	To discount, 6 per cent., 4 months..	24.00
	To draft.....	366.00
		\$400.00 \$400.00
May 1.	To merchandise received.....	\$400.00
	By merchandise.....	\$500.00
10.	To discount \$100, 6 per cent., 2 mos.	8.00
	To freight on \$500, or last shipment.	12.50
	Draft.....	84.50
		\$500.00 \$500.00

The above is only supposing the shipment of \$500 amount is dated the same date as first shipment of \$400, or the discount only allowed from date of first shipment; also that the error is entirely with the shipper, causing him to pay freight on both the first and second shipments.

May 1.	To merchandise.....	\$400.00
	By merchandise.....	\$500.00
10.	To discount, \$500, 4 mos.	\$80.00
	By discount, \$400, 2 mos.	12.00 — 18.00
	To freight \$500 shipment.....	12.50
	To draft.....	69.50
		\$500.00 \$500.00

The shipper to allow freight on both shipments and 6 per cent. discount from date of first shipment.

C. M. C.

#### Solution H.

A would send B settlement as follows:

You omit giving freight on second shipment, but I presume if freight on \$400 worth of goods was \$10 the freight on \$500 worth would be \$12.50, and it is clearly right that B should be charged with freight on both shipments; also right that B should pay A interest on check sent first, and freight paid first, or 6 per cent. per annum on \$376 for 60 days.

Statement A should send B :

By merchandise, first bill.....	\$400.00
" " second bill.....	500.00
To freight, first bill.....	\$10.00
" cash, first bill.....	366.00
" freight, second bill.....	12.50
To 6 per cent. cash discount, second bill.....	30.00
To 6 per cent. per annum interest on \$376 for 60 days' time A was out of the use of his money.....	3.76
To merchandise returned.....	400.00
	\$822.26
To check, balance due.....	77.74
	\$900.00 \$900.00

T. K. P.

#### Solution I.

The shortest way is as follows :

Last mdse. amount to.....	\$500.00
First mdse. returned.....	400.00
	\$100.00
Less 6 per cent.....	\$6.00
Freight.....	12.00 18.00
Due.....	\$82.00

Or this might seem plainer to some :

Second mdse.....	\$500.00
Cr.	
6 per cent.....	\$30.00
Freight.....	12.00
Freight first lot.....	10.00
Check for goods returned.....	366.00 418.00
	\$82.00

Same as first example. W. A. M.

#### Solution J.

The account should be settled as follows :

Dr.	
To freight paid.....	\$10.00
" 6 per cent. discount.....	24.00
" cash to balance.....	366.00
	\$400.00
Cr.	
By merchandise, first lot .....	\$400.00
Dr.	
To net amount cash paid on merchandise sold....	\$10.00
	360.00
	\$376.00
To 6 per cent. discount for cash.....	30.00
" cash to balance.....	94.00
	\$500.00
Cr.	
By merchandise, second lot.....	\$500.00
Dr.	
Or if A was inclined to claim two months' interest on his payment of \$376	

on the first lot, the account would appear as follows:

Dr.	
To cash paid on first lot.....	\$376.00
" interest two mos., 6 per cent.,	
for A.....	3.76
" 6 per cent, cash discount on \$500.	30.00
" cash to balance.....	90.24
	\$500.00
Cr.	
By merchandise, second lot.....	\$500.00

#### Solution K.

The correct way to settle the account is for B to pay A interest on \$377, the amount of money A remitted and paid out for freight. And A is entitled to 6 per cent. on \$100, the amount between first and second bill. This, of course, does not take in the consideration of damage A sustained by not having the goods promptly, if he did lose on that account.

J. H. S.

#### Solution L.

My answer is:

A should remit to B \$100, less \$6 and the freight on the last lot of goods sent, and possibly drayage on the former lot, to return same.

H. H. H.

#### Solution M.

All we have to consider is what is the cash (10 days) price of the goods at the point of destination. The freight and discount simply have the effect to reduce the invoice to this cash price. The answer then is: The cash value of the first lot of goods at destination is \$366. The cash value of the second lot is \$457.50. The first having been paid, the sum of \$91.50 will balance the second invoice.

Any question about return freight or interest on the \$366 is to be determined on the ground as to which party may have been to blame.

I. S. C.

#### Solution N.

As stated and A's account settled.

Face of invoice.....	\$400.00
Less 6 per cent.....	24.00
Less interest.....	10.00
Draft.....	366.00
	400.00

If goods returned, B owes A \$366, and makes A another shipment amounting to \$500, subject to same terms, making—

A debtor to B.....	\$366.00
B's merchandise account Cr.	\$500.00
Less 6 per cent. on \$500....	30.00
Less freight.....	12.50
Draft.....	91.50
	500.00

Or take difference in original invoices of.....	\$100.00
Subject to terms, 6 per cent.	6.00
Freight.....	2.50
	8.50

Draft to settle..... \$91.50

The error is admittedly with the shipper, therefore above would be a just and correct settlement.

H. C. W.

## Improvements in Family Spring Scales.

THE UNIVERSAL FAMILY SCALE COMPANY, Guilford, Conn., owned and operated by I. S. Spencer's Sons, and for which L. L. Hull, Clinton, Conn., is general agent, have recently commenced furnishing their line of Family Spring Scales with pure aluminum dials and rubber feet. The company are confident that the use of aluminum for dials will be appreciated by the trade inasmuch as it will prevent the liability of tarnishing, while in case they become soiled they can be easily cleaned with soap and warm water, so that they can always be kept bright. The company

call attention to the rubber feet as protecting the surface on which the scale is placed from being marred, while they will also prevent the scale from sliding or jarring off on to the floor. The company are now placing on the market a Scale of 12 pounds capacity, and hope to have one of 24 pounds capacity ready by May 1, following as soon after as possible with a 48-pound Scale. The company advise us that although these improvements have increased the cost to a considerable extent, they have decided to make no advance in the selling price, but orders will be filled at the same prices as heretofore. The company have made application for patents on the above improvements.

## Mail Orders.

FROM the mail order department of the Simmons Hardware Company, St. Louis, we are in receipt of a pamphlet of some 20 pages, entitled "Pointers on Mail Orders," which contains many practical and detailed suggestions. They refer to the importance of the retailer's keeping a stock well assort, and intimate that it is a mistake in these days of quick freights for a merchant to buy an unnecessarily large stock at one time. They, therefore, suggest the desirability of ordering by mail frequently in small quantities and for just such goods as are needed. The danger of overstocking is emphasized, and it is suggested that in novelties especially very small lots are sufficient at first. Inasmuch as a mail order being voluntary expresses preference for and confidence in a house, it is referred to as a high compliment and should command the best attention and lowest prices. The pamphlet gives many excellent suggestions, the general character of which may be inferred from the following:

Write only on one side of a sheet of paper. Well written mail orders are never copied, but are filled from the original order. Where orders are written on both sides of a sheet it necessitates their being recopied—recopying is one cause of delay.

Write only one item or size on a line.

Do not crowd your writing on a sheet. A crowded order is hard to read.

Nothing but the order and instructions in regard to shipping and filling orders should be on the order blanks.

Nothing causes more delay in attending to the customer's wants than their writing about several subjects on one sheet.

If dealers will write in regard to orders, remittances, quotations, &c., on different sheets, these letters will then immediately on receipt be sent to their proper departments to be answered on the day they are received. Each part of such letter should be complete in itself as if no other letter had been written at the same time to the house on another subject.

Many definite and practical suggestions are also made in regard to ordering certain lines of goods. For example, when customers call for Bolts Carriage Bolts are always sent. Merchants should state whether Cast or Steel Butts are wanted, as in some sections nothing but Steel Butts are used, and in others only the Cast Butts. Suggestions are made in regard to

definiteness in the orders of many other goods, such as Boilers, whether Wash or Coffee, Cartridges, Lawn Mower parts, Screen Doors, Forks, T-Hinges, Pick Handles, Locks, Lamp Chimneys, Nails, Poultry Netting, Crosscut Saws, Sad Irons, Trowels, Traps and many others. The pamphlet contains a large amount of useful information on the subject to which it relates, which will be of value to the retail trade. It would be very much to the advantage of both retailers and jobbers if more careful attention were given to such matters.

## Manufacturers and Jobbers.

AN ADDRESS BEFORE THE HARDWARE MERCHANTS AND MANUFACTURERS' ASSOCIATION OF PHILADELPHIA.

BY HUGH McCAFFREY.

THE INTERCHANGE of business ideas and comparison of business methods of our regular monthly meetings are good things, for in the multitude of counsel there is strength, and I am sure that out of the frequent association of the members in friendly discussion many of us will gain useful knowledge, which will be of service to us in the conduct of our business. The careless man will have new energy instilled into him, the sluggard will be awakened to the necessity of keeping abreast of the times, and the go ahead, progressive man will be incited to new activity when he realizes that his fellow members are following closely after him.

Philadelphia has the name of being the greatest manufacturing city in the United States, and possibly in the world. Her largest and best known factories were started in small ways by men of humble origin, but who laid solid and sure foundations upon which they have constructed industries which will perpetuate their names in an honorable way as long as free government lasts in this country, and that we trust will be forever. Not the least among the manufacturers stand the Hardwaremen in point of honorable management of their business, and in glorying in the good name of our city, we can justly claim that part of it is due to our exertions.

In upholding that good name and by seeking to extend our trade it is well for us to consider the best steps toward accomplishing the end sought for, and in my judgment one of the most important things is to cultivate more intimate relations with the Hardware merchant or jobber. The manufacturer not already in a market which is covered by a jobber should first consult him about introducing his wares, agreeing to pay him the highest figure that can be given to him. In that way he will cover two points, viz., he will sell or distribute his goods and he will create a demand or market for them so that others may be induced to sell them.

If the manufacturer is unable to interest the jobber in his goods he has a

tremendous task before him, and unless he be a young man possessed of energy and push, with good wares to back him up, the chances are that he will fail to do a large trade or accumulate much money, and he may end his career as a manufacturer at an early date.

Of course there are other ways open to him. One of them is to manufacture new goods. Dealers like to handle new goods, because every one is not familiar with their price, and a good round profit can be made upon them before the jobbers' salesmen get acquainted with their prices. But if he cannot get out new goods and his balance for the year shows little or no profit, with perhaps some bad debts into the bargain, why then let him invent some new machinery or pay some one to invent it for him, so that he can produce his goods at less cost than his more prosperous rival, capture more customers and make more money.

With our experience as a manufacturer, however, we would advise the course we are trying to pursue of having the jobber distribute our goods for us. He can do it at less cost than we can; his traveler covers all points, carrying with him perhaps 100 kindred articles, tempting buyers to give orders which we could not obtain. He also knows whom to give credit and to what extent, and consequently saves the manufacturer from much loss and bookkeeping, not to say anything of the annoyance of doing business with many who have no business training and who seem to think that no bill should be paid unless there is a claim of some sort or other that will reduce it.

As to our reliance upon the jobber, we have the best of faith. The trade has done so well in Philadelphia for 20 or 30 years past and the percentage of failures has been so small when compared with that of merchants in other lines that we have every confidence in their ability not only to manage their own business but to aid the manufacturer in his. Their position is entirely of their own making, and if they have made more money in the past than they are making, at present it is owing no doubt to a number of causes partly beyond their control. In this connection we would make but one remark in regard to jobbers doing without traveling salesmen. We do not think it can be done safely unless they pool their business after the manner of railroads and other corporations. In our judgment the American drummer has come to stay, and the jobber who thinks he can dispense with the services of that ubiquitous individual will soon find himself to be no jobber. If jobbers would only take the advice of one of their most successful and honorable members in this city who said to us a short time ago, "We handle no goods that do not yield a profit. We care not what our competitors are doing, we will do no business nor sell any man's goods that do not pay." That principle carried out solves the whole matter.

Before closing we wish to bear wit-

ness to the fact that Philadelphia's Hardware jobbers have ever been friendly to home industries, and whenever they could they have assisted in pushing Philadelphia made goods, and it is largely owing to that fact that our Philadelphia wares are so well and favorably known throughout the United States to-day. In our opinion it would be impossible to divorce the manufacturer and the jobber without injury to both. If we are not possessed of sufficient Christian spirit to obey the Divine command, "Do unto others as you would they should do unto you," we should at least follow the grand old business maxim, "Live and let live."

### Trade Items.

**A USABLE HORSE NAIL COMPANY**, who have for the past 15 years occupied the premises at 4 Warren street, in this city, have just moved into larger quarters at 10 Murray street, which is but two or three minutes' walk from the old stand. They have the street floor and two basements, each 27 x 80 feet. We are advised their business keeps up well and that their mills are running full time.

WM. A. STOKES & Co., 30 Warren street, New York, are the general agents of the G. M. Shirk Mfg. Company, manufacturers of the North Star Refrigerators. One of the main features of this construction is a combination of dead air space and granulated cork for insulation, for the purpose of economizing the ice consumption. It is pointed out by the makers that the cork will neither settle down nor absorb moisture, and is an excellent non-conductor.

**THE NEW WAREHOUSE** of Travers Bros. Company of New York which has been opened in Chicago at 224 and 226 Randolph street, and reference to which was made in our last issue, will be under the management of S. C. Elliott, who had previously represented the firm as resident salesman. The Western business of the company has of late increased so rapidly that it was deemed desirable to carry a full stock of goods to meet the requirements of the trade in that part of the country.

C. H. TUCKER, JR., agent, now at 114 Liberty street, New York, after May 1 will be found at No. 120 of the same street, where he will carry in stock all of the various kinds of goods made by Wiley & Russell Mfg. Company, especially Taps and Dies.

**THE ATLAS TACK CORPORATION**, Dabney & Weeks, agents, will move their Chicago office May 1 from 239 to 193 Lake street.

J. C. McCARTY & Co., 97 Chambers street, New York, among the special notices in this issue, direct attention to desirable store premises, fitted with shelving, gas fixtures, elevators, &c., recently occupied by the Reading Hardware Company, 79 Reade street. This is in the heart of the Hardware district, with an entrance also on Chambers street.

**RUSSELL JENNINGS MFG. COMPANY** are sending out a circular to such of their jobbing customers as are accustomed to order goods through purchasing agencies, requesting that in future their orders should be sent to the factory at Deep River, Conn. They state that they have decided not to have any third party stand between them and their jobbing customers.

**LAFLIN & RAND POWDER COMPANY**, 29 Murray street, New York, endured their fourth experience with fire on

Monday night, April 16, not to mention a large fire next door recently. The fire broke out on the top floor, burning it out completely. The damage below was entirely from water. Owing to the promptness of the fire patrol the loss was minimized by protecting the desks, &c., with tarpaulins. The company hope to be in full possession of their offices within a short time.

**GEORGE N. PIERCE & Co.**, Buffalo, N. Y., manufacturers of the Queen City Bicycles, have sent to their New York office, at 107 Chambers street, a consignment of 1893 Wheels, diamond and combination frames. They call attention to the quality of these Wheels, and state that they are offering them to the trade at very low prices.

**JULIUS BERBECKER** of the firm of Wm. Schollhorn Company, New Haven, Conn., sailed on Saturday last on the "Umbria" for a business trip in Europe. Mr. Berbecker expects to be absent for a period of about three months. On his departure Mr. Berbecker's friends presented him with a beautiful wreath of flowers, an appropriate presentation speech being made by Frank Schollhorn.

**HAZARD POWDER COMPANY**, for the past 11 years at 63 Pine street, New York, have just moved into a handsome and commodious suit of offices in the new Continental Fire Insurance Building, just approaching completion at 44 to 50 Cedar street, near William. They occupy nearly half of one of the floors in this large building. There are five separate handsomely furnished offices for the president and other officials, and a large general office for bookkeepers, clerks, &c. The walls are finished in cream and gold, the partitions, desks and railings of antique quartered oak, and the floors of hard wood. The whole is lighted by electricity.

**WE ARE ADVISED** by the Rhode Island Perkins Horse Shoe Company, Providence, R. I., that unwarranted use has been made of their trade marks, Perkins' XL and Perkins' Light Steel Shoe, by certain parties in their bids for Horse Shoes for the Government at Jeffersonville, Ind. Such use is referred to by the company as unauthorized and an infringement of their rights, and action has been taken to stop it.

**PECK, STOW & WILCOX COMPANY**, Southington, Conn., have bought the patents and rights relating to the Ellrich & Hart Saw Sets, heretofore made by the Ellrich Hardware Mfg. Company, Plantsville, Conn., and have commenced the manufacture of the goods.

**EDWARD B. MODE**, formerly of Kent Iron and Hardware Company, has opened an office at 1 West Second street, Wilmington, Del., where he will conduct a brokerage and commission business in Iron, Steel, Hardware and Coach Supplies. Having associated himself directly with manufacturers of these goods, Mr. Mode refers confidently to his ability to make satisfactory prices on materials of good quality.

**ALBERT M. FIELD**, a grandson of Albert Field, has been appointed mill agent of the Atlas Tack Corporation at Taunton, Mass., vice N. B. Dean, resigned. The Field family have recently acquired a large interest in the corporation, having purchased several hundred shares of the stock. The terms were private, but the price paid is said to have been par. The Field plant at Taunton is, we believe, the largest Tack manufacturing plant in the world. The business was established in 1827 by Albert Field, who was probably the most successful and prosperous manufacturer ever engaged in this industry.

## Made in Germany.

A RECENT issue of the *Hardware-man*, published in Birmingham and London, has an extended illustrated article describing how goods can be made so cheaply in Germany. According to that writer goods are often made by convict labor in prison workshops, for which the *concessionnaire*, or contractor, pays at the rate of 3 pence to 1 shilling per day, according to a man's work and capacity. Under another system the prison authorities undertake the work by the piece and charge the *concessionnaire* so much per hundred for the finished article, according to a schedule agreed upon. The *concessionnaire* sends all his raw material and any plant that may be needed to the prison and hires his labor from the prison governor, after which the *concessionnaire* has the goods taken to his warehouse, whence he sells them. The *concessionnaire* employs his own labor master, a practical tradesman or mechanic, and sends him into the prison to teach the convicts. He is provided with a cutlass and his bunch of keys, and does duty as a regular warden in the regulation uniform, at the same time seeing that the prisoners do their work in a sufficiently salable manner, and turn out enough of it to secure themselves from punishment. Among the goods noticed by the writer being made in the prisons visited by him were Brushes, Stamped Tinware, Toys, Hardware, Oil Lamps, Bull's Eye Lanterns, Sheet Iron Stoves, Cash Boxes, Carpet Scrapers, Iron Folding Chairs, Garden Seats, Bird Cages, Wire Goods, Whips, &c.

## Window Display.

A MONG other things "The Man in the Corner" says regarding show windows, in the W. Bingham Company's April circular, are the following :

I should see that everything that went into it drew attention to me and my goods. There should be nothing in it that does not belong to my business—no whirligigs, or hewgags or lay figures that might with as much propriety (or lack of it) go into a clothing house or cigar shop window. The passerby should not be able to disassociate his remembrance of the display from my store.

I should change the goods once a week. People like to see something new. They should learn to look into my window every time they pass, and would find every seven days a new list of articles for their inspection.

I should show but one line at a time. A trap set to catch all kinds of game, catches nothing. One week the carpenter should find as complete a line of his tools as I could show, with the smaller articles arranged in geometrical designs and the best goods and novelties well to the fore. The next week perhaps Pocket Cutlery, Razors and Revolvers would be tastily arranged (a piece of cheese cloth loosely spread over a fluffy bed of cotton makes a fine surface to spread such goods); then Farming Tools, or something else—and all in season. The carpenter might not be interested in Hoes and Rakes; the boys might not care a rap for the show of cooking utensils or Lamp Stoves, nor the matron give a second glance at the Revolvers, but they would all remember for some time to come the goods that did interest them and where they were shown, and would think of my store when they wanted to buy. At intervals I should pile the window full with just one article.

## The Warren Shelving.

THE ACCOMPANYING ILLUSTRATIONS of shelving, counters, &c., represent in part a line of store fixtures in the establishment of F. Ebner & Sons, Burlington, Iowa. The fixtures were made from designs by J. D. Warren, who is well known to the Hardware trade throughout the West, having been for 21 years with two prominent houses—13 years with the old firm of Pratt & Co. of Buffalo, N. Y., and for the past 8 years with the Simmons Hardware Company of St.

wall case having three sliding glass doors, with drawers underneath, above which are sliding shelf counters. A portion of the case is fitted up with oblique holders on which to hang Hammers, Hatchets, Braces, Drawing Knives, &c. The panels between the cabinets are finished with four oval beveled French plate mirrors. The end of the shelving at the front of the store terminates in a panel finished in the same style. All of the wood work is of solid oak, antique finish, richly polished. The panels are referred to as a feature in Shelf Hardware architecture, and as giving distinctive prom-

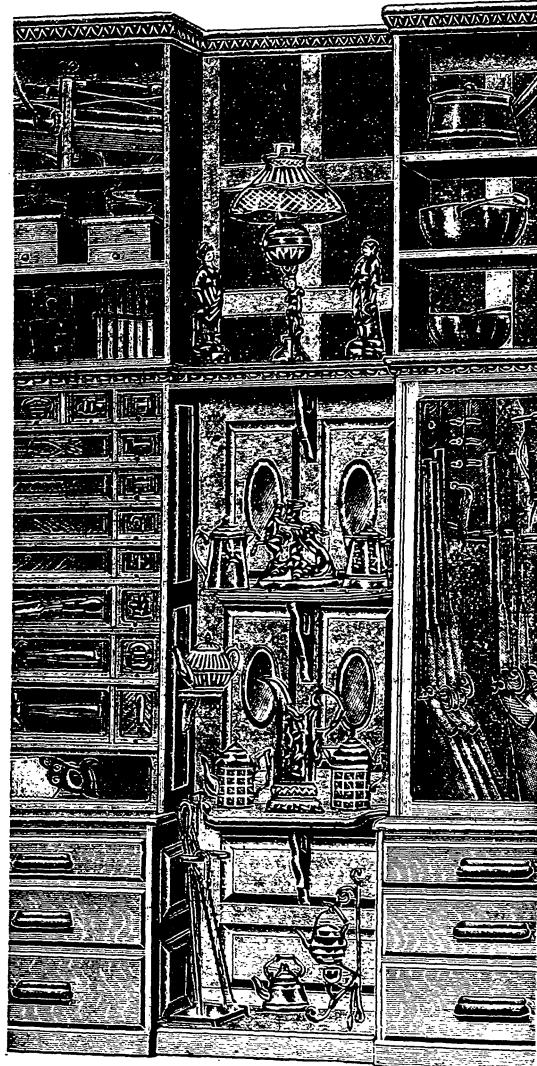


Fig. 1.—Hardware Cabinets and Panel.

Louis. Mr. Warren, the originator of the designs, has for a long time made requirements of Hardware merchants in this direction a study, and is of the opinion that Hardware merchants should have as attractive stores as those engaged in other lines of business. With this end in view the shelving shown herewith has been planned. Fig. 1 gives a general view of a portion of the shelving which is made up of cabinets with intervening panels at regular intervals.

The shelving is 12 feet high, and is supplied with sliding shelf counters, bracket rail for traveling ladder and glass front sample boxes. At the right of the panel is shown a portion of a

venience to the line of goods each cabinet and panel contains. Also that such shelving breaks the sameness noticeable in the old style of straight line shelving, in which customers are apt to see little but a line of packages or boxes; while the receding panels quickly attract attention to whatever they and the cabinets contain.

The value of fine window displays is recognized, and the object in designing this shelving was to convert the interior of the store into a display even more attractive than many show windows are, and in so simple a manner that the stock would be far more convenient to sell from and to keep track of than on straight shelves. In

Fig. 2 is given an enlarged view of the cabinet shown at the left of the panel in Fig. 1. The drawers are all interchangeable, and each has a sample back of a glass front, which protects them, at the same time improving the appearance of even the most common articles. Samples are arranged on movable wood slides, back of the glass fronts, as shown in Fig. 3. A represents the box as it appears in the shelf, while B indicates the manner in which the movable board with the sample Brace attached slides down in the grooves back of the glass front. Fig. 4 gives the top view of another shelf

incident to wooden top counters, glass top counters, as shown in Fig. 5, were devised. The top is of plate glass, strong enough to sustain 100 pounds or more weight, so that it may be used for wrapping and showing goods in the same manner as a wood top counter; having the advantage, however, of nicely displaying the goods arranged in sliding drawers, with changeable partitions, immediately underneath the glass. The front of the counter has a display case with sliding glass doors, back of which are fancy designed shelves for Tea Pots, Plated Ware, &c. The back of the counter

ing desk and base cabinet, the desks differing from each other in capacity. The desks were designed to facilitate the convenient and systematic arrangement of catalogues and price-lists, so that the merchant might instantly lay

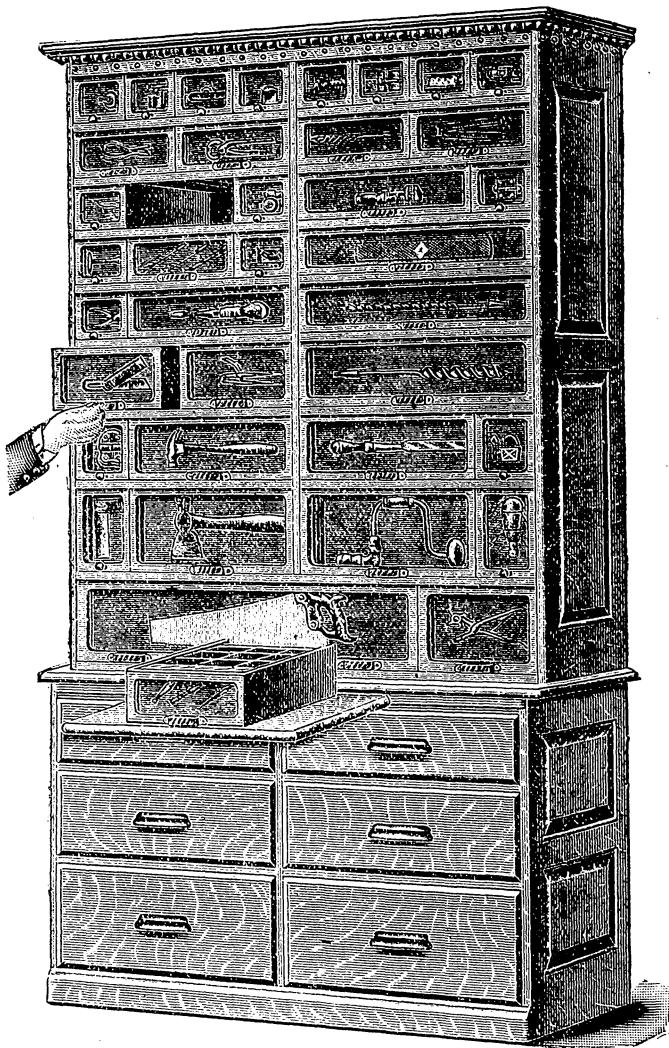


Fig. 2.—Hardware Cabinet.

box containing Hammers, and shows the sample Hammer attached to the movable slide. There are a sufficient number of grooves in the front part of each box to allow of samples of varying thicknesses being placed in position. The shelf boxes are open at the top, with the exception of an adjustable board to cover the sample, as in Fig. 4. Shelf boxes designed for Screw Hooks and Eyes, Auger Bits and similar goods, have changeable partitions to allow a number of sizes of the same kind of goods to be kept in the same box without becoming mixed, as shown in the box on the sliding shelf counter, Fig. 2.

To avoid the waste of space and opportunity to display and sell goods in-

is fitted with 12 drawers, three tiers of four drawers each, with adjustable divisions for carrying the stock of goods displayed in the top and front of the counter.

The point is made that the counters and cabinets are made of solid oak, and that all drawers fit as closely and work as smoothly as those in the finest bank and office desks or in the richest household cabinets.

Adjustable portable shelving corresponding in size to the cabinet, Fig. 2, are made with movable center divisions or supports, and with drawers and sliding shelf counters in the base. In connection with the shelving and counters are three designs of desks, combining catalogue filing case, writ-

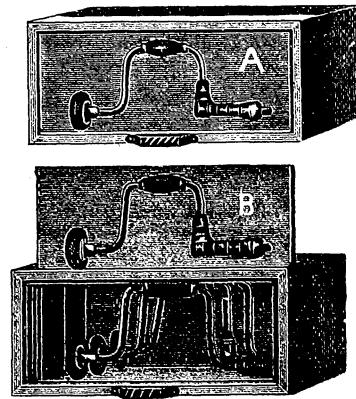


Fig. 3.—Shelf Boxes for Braces.

his hand on any list he wants to use. The fixtures, many features of which are being patented, are now being made, we are informed, under the supervision of Mr. Warren by a large desk manufacturing concern who with special machinery and abundance of material have facilities for doing the work cheaper and finishing it much finer than could be done by local carpenters. Further information regarding the shelving can be obtained from J. D. Warren, Burlington, Iowa.

IN THEIR ADVERTISEMENT, appearing elsewhere in this issue, the Superior Steel Company, Pittsburgh, Pa., manufacturers of all descriptions of Hot and Cold Rolled Strip Steel, announce that they are prepared to furnish this material in widths up to 10 inches and in thicknesses from 0.0025 inch to 2 inches, and from ordinary Hot Rolled Soft Steel to the finest Cold Rolled Watch Mainspring Steel. Announcement is also made that this firm are prepared to furnish Coils up to 5000 feet

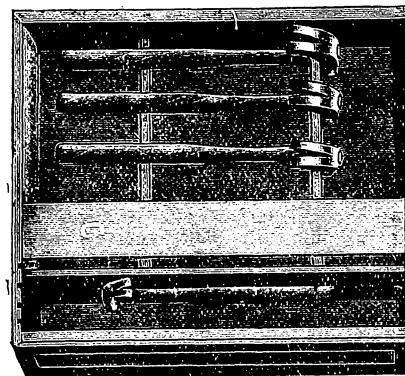


Fig. 4.—Adjustable Sample Board in Grooves.

long, according to widths and gauge ordered, and that they make a specialty of fine Crucible Steel. The further interesting announcement is made that this firm claim the distinction of rolling the longest coil of steel of its dimensions ever rolled, the same being 2 $\frac{1}{2}$  inches wide by 2250 feet long, and 0.00425 part of an inch thick. Ely and Williams, 38 Park row, New York City, and 1239 Market street, Philadelphia, Pa., are the Eastern representatives of the firm.

## Wholesale vs. Retail Experience.

BY W. E.

MANY retail merchants and others have a very exaggerated opinion of the value for a beginner of a course in a large establishment. If a young man is able to refer to his three or four years' experience with some jobbing house he is looked up to as one who has had exceptional facilities for learning his business, and who certainly must be well posted. When the son of a country merchant leaves school or college the father often secures for him employment in the business of the jobber from whom he buys his goods, so that the young man may have a good opportunity to learn the business. As it is conducive to good business relations with the customer, the jobber will agree to give the young

and deliver them at an elevator, whence they go to the packing floor. During the first few weeks he will work in company with some lad who has been in the house for some time to be broken in. Thus his sole teacher will be a boy like himself, who has no knowledge except that acquired in the same house. Having begun work in the basement, the new clerk will count or weigh strap hinges, packages of bolts, tacks and butts and similar goods. After half a year or a year he will work on the other floors, getting out tools, builders' hardware, perhaps tinware, wooden ware, steel goods, &c., and in the course of time his father will send for him to come home and assist in the retail store. Now, let us see the value of the wholesale experience.

### THE KNOWLEDGE ACQUIRED.

The new man is familiar with an immense lot of numbers of goods;

ness, and he will be almost sure to regret for many reasons the expensive business experience in the city. I use the word "expensive" advisedly, since from a money point of view it is so, because even in his third year with the great firm the young man will usually earn barely sufficient to cover expenses and will periodically require financial assistance from home. If the boy should happen to be one of those that cannot be spoiled—steady, industrious, anxious to learn—he may still become a good all round business man, but it will be in spite of his wholesale experience, not as a result thereof. Or perhaps he will have become so thoroughly conversant with the goods carried by his employers that they are loath to let him go and give him the position of caller, and he will check goods, at a fair salary, it is true. But it is to be taken for granted that the final object of our young friend's education was

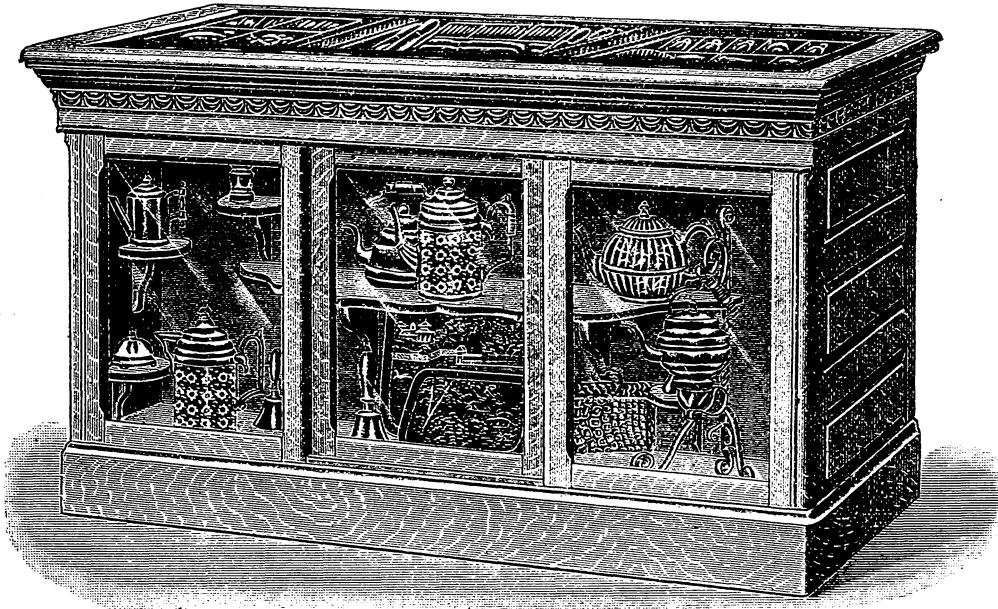


Fig. 5.—Beveled Plate Glass Top Counter.

man a situation, and will promise that he shall have every opportunity given him for acquiring a most thorough knowledge of the business.

### NEW LIBERTY.

It sometimes proves that the young man has not profited as much as was expected. Of course this is partly due to the fact that when a boy of 16 or 18 is sent to a large city where he is free from all restraint, he often makes most extensive use of his new liberty, not in acquiring a knowledge of business, but in enjoying life, to the most serious detriment of his physical and moral condition. It is true that his wages are not sufficient for maintenance, but the father knows that and regular remittances are made to cover the deficiency and to allow for enjoyments, which are presumably of a good kind.

### GETTING OUT ORDERS.

But laying aside this part of the case, let us assume that the beginner is put on orders. His duty will be to select such goods as each order may call for, collect them in a box truck,

knows the quantities in each package, the style of packages is familiar to him; he has more or less knowledge of prices of goods; he can lay out a bill of goods for the packer. But the chances are good for his not knowing how to weigh; his first teacher probably told him to be sure and give enough, so that the customer may have no chance to complain of shortages; thus he has become accustomed to down weight, giving perhaps 5½ pounds for 5 pounds. He has probably not learned to make a neat paper package quickly, or to avoid unnecessary waste of strings and paper. Often he does not know that carriage bolts are measured from under the head, or that there is such a thing as difference in quality of wood screws. It is not to be expected that he will know the different lengths of penny sizes of nails or the difference between 3 x 3½ butts and 3½ x 3 butts.

### AN EXPENSIVE EXPERIENCE.

It will take but a short time for the father to find out that over much is lacking in the son's knowledge of busi-

ness, and he will be almost sure to regret for many reasons the expensive business experience in the city. I use the word "expensive" advisedly, since from a money point of view it is so, because even in his third year with the great firm the young man will usually earn barely sufficient to cover expenses and will periodically require financial assistance from home. If the boy should happen to be one of those that cannot be spoiled—steady, industrious, anxious to learn—he may still become a good all round business man, but it will be in spite of his wholesale experience, not as a result thereof. Or perhaps he will have become so thoroughly conversant with the goods carried by his employers that they are loath to let him go and give him the position of caller, and he will check goods, at a fair salary, it is true. But it is to be taken for granted that the final object of our young friend's education was

### A BETTER EDUCATION.

Then were it not better if our retail dealer had sent his son to some good town store, where he may have a chance to learn to the extent of his native ability all of the Hardware business, and thus have a familiarity with the trade which will be serviceable to him when he succeeds his father, or by other means establish for himself? His training will then also include that most important part of a retail business manager, the ability to sell goods.

EASTERN RUBBER MFG. COMPANY, Trenton, N. J., have secured office accommodations at 90 Chambers street, New York, and will carry in stock goods of their manufacture, embracing Climax, Gem, Rex, Fleetwood and other Pneumatic Tires, Air Valves, Cement, Pedal Rubbers, Bicycle Handles, &c.

## Manufacturers' Association of Kings and Queens Counties.

THE FIRST regular monthly meeting of the Manufacturers' Association of Kings and Queens Counties was held Monday evening, April 16, in the large hall of the Pouch Mansion, Clinton and Lafayette avenues, Brooklyn. A number of practical, interesting and instructive reports were made by chairmen of various standing committees only recently organized, showing that even in the short time they had been at work much had been accomplished. The reports related to Fire Insurance, Boiler Inspection Legislation, Membership, Express Facilities, &c. The sub-committee on insurance and boiler inspection returned from Albany much pleased with the reception accorded them, and with the assurance that their mission was substantially accomplished. Twenty-five new applications for membership were favorably passed on and that number of additional members added to the roll, making 182 in all to date. The treasurer stated he had in his possession received for initiation fees and dues \$2880, with enough more handed to him during the evening to make it \$3000. The Committee on Site reported suitable accommodations, including committee and meeting rooms, had been secured for the ensuing year in the Pouch Mansion. In reporting progress on better express facilities the chairman of that committee, who has wrestled with the subject for over a decade, said that more had been accomplished in the two weeks of organization than in the last 12 years of individual effort, quoting from his own experience. A special committee of five was appointed to consider the question of telephone rates, the mover of the resolution saying he individually paid \$5000 per year for that service and which he believed to be exorbitant.

C. N. Chadwick said the best way for such a gathering to become acquainted with each other was through the medium of a dinner, and moved the whole matter be referred to the Entertainment Committee, with power to make the necessary arrangements, arrange the toasts, select the toastmaster, &c., which was enthusiastically and unanimously adopted.

## Catalogues, Price-Lists, &c., for the Hardware Club of New York.

ONE OF THE PLANS of those in charge of the interests of the Hardware Club of New York contemplates having for the use of its members a library which will contain as complete a collection of trade catalogues, price-lists, &c., as it is possible to obtain. If this is accomplished in good measure it will evidently serve the convenience of the trade and will be to the advantage of manufacturers whose catalogues and price-lists have place in such a collection. In view of the fact that within a few weeks the club rooms will be opened, the committee in charge of this matter are desirous of receiving at once the price-lists issued by all manufacturers of Hardware and related lines. Such circulars, price-lists, or other printed matter, showing the lines of goods put on the market, should be sent at as early a day

as convenient to the care of A. D. Clinch, 94 Chambers street, New York, the chairman of the committee having charge of this matter.

## Purchase of the Branford Lock Works by the Yale & Towne Mfg. Company.

BY ORDER of the Superior Court of New Haven Co., Ct., the property, franchise, good will and business of the Branford Lock Works was sold at public auction on April 14 at the company's office in Branford. The Court directed that no bid should be accepted for an amount less than the aggregate of the debts and charges, which were stated to be, approximately, \$82,000. The only bid received was that of the Yale & Towne Mfg. Company, who complied with the above condition, and who were, therefore, declared to be the purchasers of the property.

For the present the business will be continued as usual by the receiver, until a final settlement is made with all creditors, whereupon the property and business will be transferred absolutely to the new owners, the Yale & Towne Mfg. Company, by whom the business will thereafter be conducted. The uncertainty regarding the future of the business which has existed during the past few months while the question of sale was pending, has compelled the receiver to confine the operations to those absolutely necessary to the filling of actual orders. Under the changed conditions resulting from the sale this necessity will disappear, and the business will, as rapidly as possible, be put into better condition to meet the demands of customers and the trade than it has occupied for many years. The plans of the new owners are not yet fully matured, but it is probable that they will make considerable expenditure for the restoration of the plant to a condition of full efficiency and for the addition of such new machinery as may be required to enable it to produce and furnish the kinds and quality of goods which the market now demands. Although at present somewhat out of repair, the plant has always been a good one, and with moderate expenditure can be made equal to any others engaged on similar products. Of late years it has employed about 300 hands, but it is capable of effectively employing 400 or more. Its line of patterns has been considerably improved and added to during the past two years and will, doubtless, be still further strengthened in the near future.

The purpose of the Yale & Towne Mfg. Company in originally making the connection with the Branford Lock Works was to supplement their own line of high-class hardware with another of medium quality, the two combined covering the whole range of builders' hardware required in buildings of every description. The two lines are already closely identified and will hereafter be still more intimately united and will be handled practically as a unit.

W. & L. WOLF have assumed the ownership of the Star Lock Works, Philadelphia, which was established in 1858 by Hillebrand & Wolf, and conducted by them most successfully until the decease of Mr. Wolf last fall and the retirement of Mr. Hillebrand on March 31. The new proprietors, who are sons of the late Mr. Wolf, have been brought up in the business, having had, respectively, 15 and 18 years' experience, and are therefore amply qualified to maintain the reputation established by their predecessors.

## Western New England Iron, Steel and Hardware Association.

THE ABOVE ASSOCIATION was formed at a meeting of merchants held in New Haven, Conn., on the 13th inst. The object of the association is to protect the trade of its members and to establish a credit bureau. The following officers were elected: L. L. Ensworth, Hartford, president; S. S. Hunter, Bridgeport, vice-president; R. S. Woodruff, New Haven, secretary; C. C. Lewis, Springfield, Mass., treasurer. These persons with H. R. Peirson, Pittsfield, Mass.; P. J. Bolan, Waterbury, Conn.; Samuel Dudley, New London, Conn.; H. L. Russell, Holyoke, Mass., and C. M. Beach, New Milford, Conn., comprise the Board of Directors.

## Price-Lists, Circulars, &c.

PATTERSON, GOTTFRIED & HUNTER, 146-150 Centre street, New York: Machinery, Metals, Hardware, Tools and Supplies. A metal end hanger illustrates Reeves Pulley Co.'s Wood Split Pulleys, Champion Blower & Forge Company's Blowers and Forges, and A. Leschen & Son's Rope Company's Wire Rope; goods for which the concern are agents.

NATIONAL SPECIALTY MFG. COMPANY, Philadelphia, Pa., branch office and warehouse, W. H. Jacobus, 90 Chambers street, New York: Grocers' Hardware and other specialties. An 1894 catalogue and price-list illustrates, with descriptions, National Measuring Faucet, National Coffee, Spice and Drug Mills, National Tobacco Cutter, and National Nail Puller.

ARIEL CYCLE MFG. COMPANY of Goshen, Ind.: Illustrated catalogue for 1894. This is one of Gies & Co.'s tasteful productions. It has a lithographed cover, representing the knights of the ninth and nineteenth centuries, artistically executed in colors. The contents comprise a view of the company's factory and descriptions of the Ariel roadster, the Ariel light roadster, the Turtle and the Titania, which are offered to the trade as high class productions for the use of ladies and gentlemen. The special features of these wheels are illustrated and described. Among them are the W. C. Smith detachable sprocket and the W. C. Smith patent gear case. The writer of the catalogue is evidently a close student of Shakespeare, from whose works many apt quotations have been drawn by way of literary embellishment.

GEO. I. BLOWERS, Kalamazoo, Mich.: Catalogue of Tubular Well Supplies. These goods comprise the Eureka Brass Cylinder, Setting Tools, Dog Couplings, Wood Rod Couplings, Tubular Well Valves, Combined Sand Pump and Drill, Pipe Reamer, Turned Couplings, Well Shoes, Plunger Leathers, Brass Jacket Pipe, Points, &c. The lines of Tubular Well Valves and Pipe Points are especially extensive, covering a great variety of styles and sizes.

BELLEVUE PUMP COMPANY, Bellevue, Iowa: Catalogue of Kegler's Patent Galvanized Iron Chain Pump, Tubing and Curb. This catalogue describes the Kegler Tubing, which is so constructed as to be ready for use with any chain, any rubber bucket or any curb; also the Kegler Patent Curb of Galvanized Sheet Iron, which is 10 pounds lighter than the ordinary wood curb and much more durable. The company at the

same time are prepared to furnish Wooden Curbs to those who desire that method of construction. They have also brought out a new iron plate or platform to be used in place of a wooden platform on stone well covers. It is made to fit the Kegler Iron Curb.

THE SPECIALTY MFG. COMPANY, Hartford, Conn.: Tack and Nail Pullers. An illustrated circular and price-list shows Columbia Tack and Nail Puller combined, the Boss Barrel Nail Puller, the Hartford Nail Puller, Black Hawk Nail Puller, and the Columbia Nail Puller and Setter. Attractive hangers, printed on both sides, call attention to these goods.

THE MALIN COMPANY, Cleveland, Ohio: Spool Wire for retail Hardware trade. A catalogue, many illustrations in which are in colors, gives prices and sizes on Spools of Hair Wire, Annealed Steel Wire, Annealed Tinned Steel Wire, Soft Brass Wire, Spring Brass Wire, Soft Copper Wire, Music Wire, all being shellac coated. Retail dealers' stock of Spooled Wire is shown assorted in boxes; Wire spooled for use on automatic machinery; also Steel Bale Ties. Ludlow Saylor Wire Company, St. Louis, Mo., are agents for the sale of these goods.

THE STORM MFG. COMPANY, Newark, N. J., for whom John H. Graham & Co., 118 Chambers street, are agents: Dumb Waiters and Elevators. An 1894 catalogue shows a line of their well-known goods; fixtures alone being furnished or everything complete, which includes car, all ropes, runs, counterweights, &c. The Manhattan Dumb Waiter is now being made with bevel gear fixtures so that the counterweight can go at the back, in addition to the regular styles of gearing; the list price for the bevel gear fixtures being an advance on the other styles. The company have added a Basement or Sidewalk Elevator, which is made of any size or capacity desired; also a Hand Elevator with double geared belt power attachment having a capacity of from 1500 to 2000 pounds.

ST. LOUIS STEEL WIRE BRUSH COMPANY, St. Louis, Mo.: Steel Wire Brushes and Brooms, also Pilling's Piston Packings. An illustrated catalogue and price-list shows these goods in a variety of styles and sizes.

MECHANICS' SUPPLY COMPANY, Quebec: Plumbers', Machinists', Engineers', Gas and Steam Fitters, Mills and Steamboat Supplies, Telephone, Telegraph and Electric Bell Material. A folder under date of April, 1894, calls attention to these goods, and gives a list of manufacturers for whom the company are sole agents.

KIRTLEY BROTHERS, Kansas City, Mo.: Sanitary and Contracting Engineers. A pamphlet is devoted to the Neff system of water works, and contains testimonials in favor of this system of domestic water works operated by compressed air.

THE CLEVELAND NOVELTY COMPANY, Cleveland, Ohio: Hardware Specialties, Awnings, Tents, Flags, Canvas and Wire Goods. An illustrated price-list shows Grass Catchers, Lawn Sprinklers, Fruit Pickers, Pants Stretcher, Mop Wringers, Clamps, Mechanics' Apron, Tool Baskets, Bags and Satchels, Feed Bags, Flags, Awnings, Tents, Wire and Canvas Cots, Camp Stools, Sidewalk Canopies, &c.

BORDEN - SWEARINGEN SHUTTER & IRON WORKS, St. Louis and Kansas City, Mo.: Perkin's patent double plate air space, rolling and swing fire proof Shutters and Doors; and steel coil Shutters. A catalogue illustrates and explains the construction and working of the Shutters and Doors.

## It Is Reported—

### Alabama.

That R. A. Posey has recently commenced the Hardware business at DADEVILLE.

### California.

That J. W. Morrison has sold his Hardware store at SANTA ANNA to S. C. Wright of MCPHERSON, KAN., receiving in payment therefor a section of Kansas land and other considerations. Mr. Wright will conduct the business under his own name.

### Colorado.

That Judge Walter T. Brown, for years engaged in the Hardware business at FORT MORGAN, but a resident of DENVER the past eight months, has purchased an interest in the Mitchell-Patton Mercantile Company.

### Connecticut.

That on the afternoon of the 14th inst. fire broke out in the attic of the establishment of the Way Hardware Company, HARTFORD, and an hour later when the flames were extinguished the stock in the store below had been damaged by water to the extent of about \$10,000. The company carry a stock of nearly \$25,000, and a good portion of this was thoroughly drenched. Rubber blankets were placed over the stock as far as possible, but the water came down in such floods that scarcely anything could be kept dry. The loss is fully covered by insurance.

### Delaware.

That the large Hardware stock of Bellah & Co., WILMINGTON, has been disposed of at auction.

### Georgia.

That the Hutchinson Lumber & Supply Company of CORDELE are intending to engage in the Hardware and mill supply business, doing both a retail and wholesale trade. W. B. Hutchinson is president of the company, C. E. Arnt, treasurer; A. Kirtland, general manager, and J. W. Moore, secretary.

### Illinois.

That T. E. Peck has opened a new Hardware store at VIRGINIA. He will also carry Tinware and Stoves.

That S. J. Stebbins' Hardware store, at 39 Van Buren street, CHICAGO, was damaged by fire on the 9th inst.

That German & Friedman of PRINCEVILLE have bought out the Hardware and Implement business formerly operated by Mr. Moore, at BRIMFIELD.

That T. B. Bray has sold his interest in the Hardware store at ELIZABETH to his partner, H. Weir. Mr. Bray will probably enter the dry goods business in the near future.

That Burder & Co. are proprietors of a new Hardware store at ORION.

That the residence and Hardware store of F. Webber, FAIRBURY, were destroyed by fire on the 8th inst.

### Indiana.

That the Hardware store of William M. Johnson, at ILION, was entered by burglars on the 10th inst., the safe broken open and \$300 stolen.

That fire on the 5th inst. destroyed the stable and warehouse of J. B. Barnes, Hardware merchant, of ANDERSON. The loss was \$2000, with no insurance.

### Iowa.

That arrangements have been perfected so that Gortner & Burt are again conducting their Hardware business at LAKE CITY.

That burglars broke into John F. Hays' Hardware store, at CLINTON, on the 6th inst., and stole goods to the amount of nearly \$200.

That Mr. Stalford of DES MOINES has purchased G. F. Brayton's Hardware store at PERSIA.

That Wilber Van Cleef has bought the Hardware store formerly owned by W. J. Wood, ELLIOTT.

That Ford & Bailey is the style of a new Hardware store at DUNCOMBE.

### Kansas.

That the Hardware store of F. B. Orr, HARPER, was burglarized a short time since. About \$100 worth of goods were stolen.

That C. W. Young, dealer in Hardware and Implements, GREENLEAF, has sold his stock of Hardware to C. O. Graves. Mr. Young will continue the Implement business.

That C. S. Lucas of MARYVILLE, Mo., has decided to open a Hardware store at ARGENTINE about May 1.

### Maine.

That Kelley & Eastman's Hardware store, at RANDOLPH, was entered by thieves on the 9th inst. and \$150 worth of goods taken.

That John Watson, Hardware merchant, of HOULTON, is building a large storehouse 50 x 150 feet.

### Massachusetts.

That the Hardware establishment of Whitcomb-Carter Company, BEVERLY, was robbed on the 6th inst., 50 Revolvers, a dozen or more Razors and about 25 Jack Knives, valued at more than \$200, being stolen.

That W. H. Hitchcock, PALMER, has added a stock of Tinware to his Stove and Plumbing business.

That the Arthur C. Harvey Company have been incorporated under the laws of Massachusetts, with a capital of \$20,000, to succeed Arthur C. Harvey & Co., dealers in Iron, Steel, and Heavy Hardware, 115 Purchase street, BOSTON.

### Michigan.

That the Hardware firm of Taylor & Winer of ELKTON have dissolved by mutual consent, Mr. Winer succeeding to the business. Mr. Taylor has not yet decided as to what he will do in the future.

That the stock of the Mather Hardware Company, MUSKEGON, has been sold to the Towner Hardware Company, the consideration being \$17,000.

That the Hardware firm of Rennie & Godfrey, BUCHANAN, have been dissolved, Mr. Godfrey buying out Mr. Rennie's interest.

### Minnesota.

That Mr. White has sold his interest in the Hardware firm of Tenger, Wegener & White, ALEXANDRIA, to his son Carl White.

That the Schroeder & Niebuhr Hardware Company, GOOD THUNDER, has been dissolved by mutual consent.

That preparations are being made for opening a new Hardware store at RAINY LAKE CITY under the style of Prescott & Kingsbury.

That Schneider Bros. have opened a new Hardware store at ADAMS.

That Dunford & Pollitt, Hardware dealers, CANTON, have dissolved.

That John N. Ostby & Son, dealers in Hardware, Tin, &c., FERTILE, have sold out.

That Meacham Bros. have sold their Hardware store, at EDGERTON, and bought out J. Delano, at RED WING, which business will hereafter be conducted by them under the above style.

### Missouri.

That Clark & Drake's Hardware store, at WARSAW, was robbed on the night of the 6th inst.

That the Thayer Hardware & Furniture Company of TANEY COUNTY

have been incorporated, with a capital stock of \$10,000.

#### Nebraska.

That W. F. Rockwell of ALLIANCE has decided to open a new Hardware store at WYMORE.

That J. H. Castle's Hardware store, at CLARKS, was robbed on the 6th inst., and \$125 worth of Revolvers, Razors and Knives carried off.

That W. L. Spear's stock of Hardware and Agricultural Implements, at GENEVA, was destroyed in a large fire in that place on the 7th inst.

That the Carter-Cottrell Hardware Company have succeeded Himebaugh & Co. at OMAHA.

#### North Dakota.

That O. M. Bale has retired from the Hardware business at HOLTON.

That A. Baldwin will open a new Hardware store at BATHGATE.

#### Ohio.

That the Hardware store of Martin & Countryman, HICKSVILLE, was robbed of \$100 worth of Revolvers, Knives and Razors on the 6th inst.

That the Mitchell Bros. Company, CLEVELAND, have been incorporated, with a capital stock of \$15,000. They will conduct a general Hardware business, in connection with which they will manufacture Tin and Sheet and Galvanized Iron Ware.

#### Oregon.

That Scott Bros. & Co.'s Hardware store, at OAKESDALE, was destroyed by fire a short time since. The loss was \$2500. The fire was of incendiary origin.

*The Hardware trade throughout the country are requested to report business changes, improvements and other matters of trade interest suitable for mention in this department.*

### Avery's Silver Steel Hollow Ware.

Avery Stamping Company, Cleveland, Ohio, who are known as pioneers in heavy metal stamping, are putting on the market a full line of stamped steel hollow ware and are in a position to fill orders promptly. The line includes solid and riveted handle spiders, solid and riveted handle cake griddles, bailed cake griddles, round, flat and pit bottomed kettles, maslin kettles, stew pans, Scotch bowls, stew pots, hotel steel stew pans and pots, also pure nickel hotel sauce pans. The goods are furnished either polished, tinned, mirror polished or enameled, and are described as light, strong, durable, clean and of attractive appearance. The first cost of these goods is referred to as being far below copper and as rapidly replacing the same. The company also furnish the goods polished on the inside for what is called grease cooking. Attention is called to the nickel sauce pans, and while they are a little more expensive at first cost than copper, they are guaranteed by the manufacturers for 8 or 10 years. Emphasis is placed upon the finish and quality of the entire line of these goods.

### Paints and Colors.

*It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.*

*White Lead.*—The market is without really new feature. Fairly large quantities of Dry Lead are being moved out, chiefly through deliveries on old contracts, and the distribution of Lead

in Oil has also been of fairly good proportions. New business has been better the past week than during the preceding one, yet only fair all told. In prices there is still more or less irregularity. The National Company quote 5¢ for Dry and 5½¢ @ 5¾¢ for Lead in Oil, to buyers of large lots, and business has been done at those figures with an understanding that satisfactory rebates will be made at the end of the year to those buyers who refrain from maneuvers calculated to depress the market. Outside producers meanwhile take orders at 4½¢ @ 4¾¢ cash for Dry Lead and 5¢ @ 5½¢ for Lead in Oil. The various Mixed Leads are offered at all manner of prices.

*Red Lead.*—Apart from routine sales of the better grades used for house painting and similar purposes there has been little business, and the market is at present in a dull and uninteresting condition. Prices are not positively lower, but there is a rather soft undertone to the market and popular quotations for foreign and domestic brands would probably be shaded in the event of orders for round lots coming up for competition.

*Litharge.*—More and somewhat larger contracts have been placed for the lower grades, chiefly by rubber manufacturers, for prompt and near future deliveries. Other consumers of the low priced product are still very indifferent buyers, however, and the high grades meet with indifferent sale. There is some irregularity in prices, with a leaning in buyers' favor, but no radical change has taken place during the past week.

*Zincs.*—The market for American Oxide has been quiet and not without some signs of rather weaker undertone, particularly in the instance of the lower grades. Deliveries to grinders on old contracts are practically completed by some manufacturers. There is, therefore, rather freer offering, and rumor has it that popular quotations would be shaded a trifle to help along sales of round lots. No concessions are made on ordinary jobbing quantities. Foreign brands are selling at premium prices, but in small quantities only.

*Colors, &c.*—In the market for Dry Colors nothing has transpired that would relieve the market from the monotony by which it has been characterized for some time past. Business is only fair, hardly up to the average for the season in fact, and prices have changed very little. There has been a very fair movement of Oil Colors and some lines of Ready Mixed Paints, but not enough to bring about any important changes in prices.

### Oils and Turpentine.

*Linseed Oil.*—Of moderate sized lots for prompt delivery there have been very fair sales. Otherwise the movement continues slow and neither business nor inquiries show any sign of livelier buying interest. The situation, as far as the selling interest is concerned, is also devoid of radical change. Prices remain just about as they have been for two or three weeks past. In this city raw Oil of local make sells at 52¢ by the single cash and the same price is quoted for larger quantities. Western brands are offered here at 50¢, in moderate quantities, and could probably be secured at a little less in carload lots. At Western centers there are sellers at 48¢ and that price is said to have been quoted on carload lots delivered at some New England points.

*Cotton Seed Oils.*—Moderate sales and indifferent sort of demand have been experienced during nearly the entire week. Exporters have manifested very little interest, the large Western consumers have purchased sparingly

and other home trade demand has been of strictly commonplace character. In prices only slight changes have taken place, but a rather weakish undertone has prevailed, as usual when the market is dull. At this writing the indications are that radical changes in the immediate future are contingent upon a revival of speculative interest or more pressure of Oil for sale by manufacturers.

*Lard Oil.*—City pressers have made no changes in their prices. They quote 63¢ @ 64¢ for prime Oil, prompt delivery, and corresponding figures for the low grades. Prices for outside brands have also remained almost stationary. Business has been strictly routine and moderate, all told. The demand has been hardly as good as it was during the two weeks preceding the one under review.

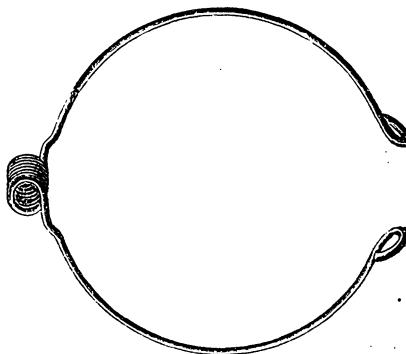
*Fish Oils.*—The association prices for crude Menhaden have been reduced to 25¢ for Southern and 26¢ for Northern product. This is a cut of about 6¢ from late official prices, but, as yet, it has failed to arouse livelier buying. The manufactured products are lower, in sympathy with the decline in the crude article. Crude Whale has been in slightly better request and a few hundred barrels Southern were sold at 35¢. Crude Sperm remains very quiet and unchanged. Manufactured Sperm and Whale Oils are slow of sale and rather weak in price.

*Miscellaneous.*—Common Olive Oil in barrels is rather weak. Small lots on the spot have been sold at 58¢ @ 60¢, and as low as 55¢ @ 56¢ was quoted on round lots for future delivery. Coconut Oils have been selling very fairly at quite steady prices. Red Oils are rather weak in price, with only moderate sales making.

*Spirits Turpentine.*—Prices have ruled a fraction lower, late business having been chiefly at 29½¢ for regular and 30¢ for machine barrels. Business has been moderate, and the demand at present is rather slow.

### The Palmer Trouser Guard.

R. T. Palmer, 31 Otis place, Buffalo, N. Y., is placing on the market the trouser guard for bicyclists represented in the accompanying cut, which shows



*The Palmer Trouser Guard.*

it open in the position it assumes on the ankle. It consists of spring wire coiled at the back with the ends formed in loops weighing ½ ounce each. It is claimed that the guard is equal in strength and holding power to any guard now on the market. The manufacturer's claim for superiority lies in the neat manner in which it can be folded to fit the vest pocket when not in use. The guards are furnished either nickel-enameled or enameled and are packed one pair in an envelope, three dozen in a box.

**Hamblin & Russell's Hose Mender.**

The accompanying cuts represent a hose mender being introduced by Hamblin & Russell Mfg. Company, Worcester, Mass., with New York office and stock rooms 52 Cliff street. As shown in Fig. 1 the mender consists of

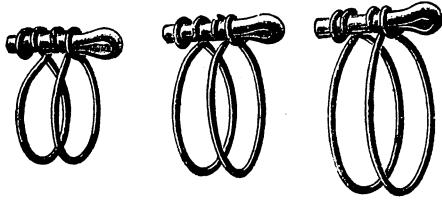


Fig. 1.—Hamblin & Russell's Hose Mender.

a piece of copper wire bent to the required shape, the ends of which terminate and are held between the two parts of the steel T. The point is made that without tools any one can mend their hose by twisting the T by means of a common nail. Twisting the T tightens the band; the short nip that the wire has on the T will not admit, it is stated, of the band loosening. In

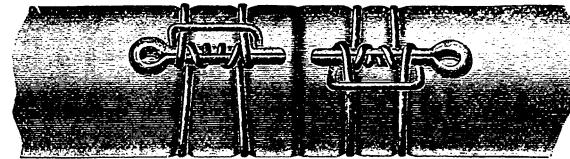
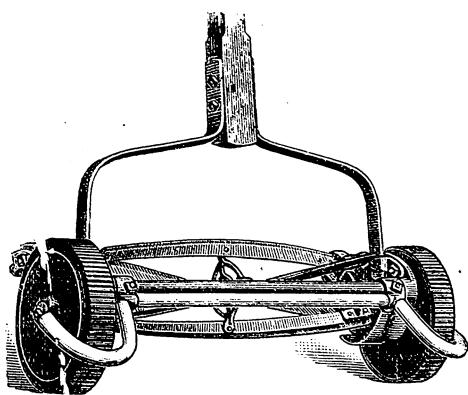


Fig. 2.—Hose Menders Applied.

Fig. 2 menders are shown on hose. The menders are made in three sizes, for  $\frac{1}{4}$ ,  $\frac{1}{2}$  and 1 inch pipe, and are packed one-half gross in a box, 12 gross in a case.

**Philadelphia Lawn Mower Fender.**

The Philadelphia Lawn Mower Company, Philadelphia, Pa., are offering a lawn mower fender, as illustrated here-

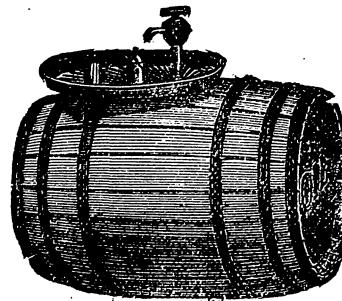


Philadelphia Lawn Mower Fender.

with. It consists of a rubber covered steel rod, which is fastened around the wheels and along the front of the mower. Its design is to prevent damage to trees and shrubbery, tombstones, copings, &c., by the careless use of mowers. The fender is the outcome of a request made by the United States Cemetery Association to lawn mower manufacturers to devise a suitable fender. The fender here shown has been adopted by this association as filling the requirements of the case.

**Barrel Pan for Oil Barrels.**

Sidney Shepard & Co. Buffalo, N. Y. are putting a barrel pan on the market, an illustration of it being given herewith. The apparatus consists of a pump, which is inserted in the barrel,



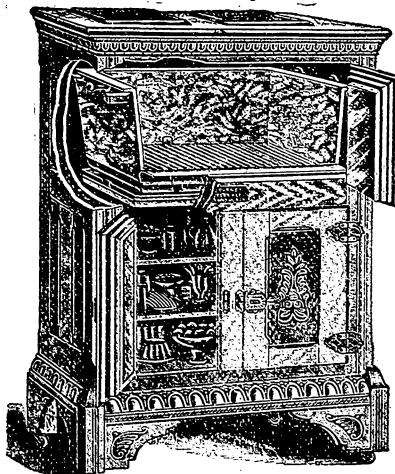
Barrel Pan for Oil Barrels.

and a pan surrounding it, the bottom of the pan being corrugated toward the pump aperture, thus draining all drippings of oil back into the barrel when pumping oil from the barrel. The pan is of ample size to accommodate measures, funnels, cans, &c. The different

parts are referred to as well and substantially made, and the apparatus will, it is stated, fit any barrel and may be used with illuminating or lubricating oils.

**The Gurney Removable Ice Compartment.**

The Gurney Refrigerator Company of Fond du Lac, Wis., have introduced a new feature in some of their refrigerators this season, in the form of a re-



The Gurney Removable Ice Compartment.

movable ice compartment, which is herewith illustrated. It is used in that class of refrigerators in which the ice is put in through the front. It is supported by a heavy galvanized frame running around the back and two ends of the

refrigerator, leaving ample air space for the air from the provision chamber to gain access to the ice. The compartment can be so readily removed for cleaning that the merits of this style of construction are obvious. The company have very recently been granted a patent on their application of this idea to a refrigerator.

**Lu-mi-num Bicycles.**

The cuts here shown represent the steering head and wood rim used by the St. Louis Refrigerator & Wooden Gutter Company, St. Louis, Mo., on their aluminum bicycles. The manufacturers remark that in the aluminum alloy itself they have an entirely new metal or

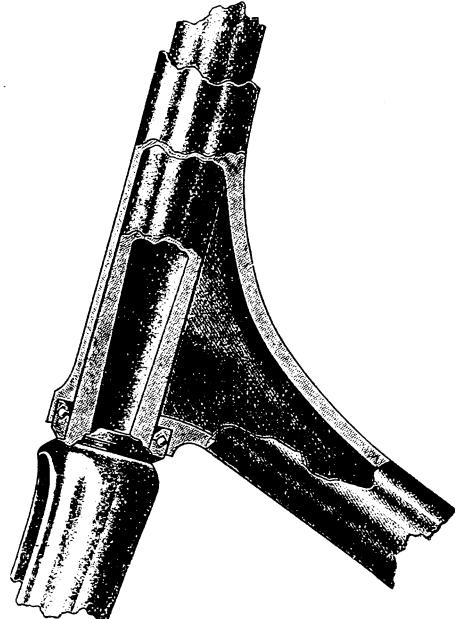


Fig. 1.—Lu-mi-num Steering Head.

material of great value in the various mechanical arts, as under laboratory tests and in practical use in cycles it has shown a combination of strength, toughness, elasticity and resiliency superior to any other material; also that the percentage of alloy being exceedingly low, the metal retains all the most valuable features of pure aluminum in being unaffected by atmosphere, water, dirt or handling, is non-corrosive, and is susceptible of taking and holding a



Fig. 2.—Joint and Valve Thimble of Wood Rim.

very high finish. In these wheels the frames, forks and handle bars are each cast in one piece, avoiding joints in the aluminum parts, and allowing, it is explained, a proper distribution of metal to insure the greatest strength at points of greatest strain. In Fig. 1 a section is shown through the lower part of the steering head, in which the metal is represented as cut away, to afford a view of the interior, and to show the features of a cast frame without joints. The manufacturers claim that as there are no bolted or screwed joints in the aluminum parts, all liability of jarring loose is avoided; that as there are no brazed or soldered joints, all liability of burning or over heating the material is avoided.

and that certain corrosion and disintegration of the interior parts is avoided where such joints are made, caused by the use of acids and other chemicals in making the joints. In making the wood rim, shown in Fig. 2, the company state that nothing but selected, second growth, Vermont white ash is used, which is obtained from the mills, dried by them, and by them handled from start to finish. The strip is first steam bent around forms, then the joint is made and the ends cemented together. The joint which is shown in Fig. 2 possesses, it is claimed, over three times the holding surface for the cement. It is stated that it interlocks in every direction, that one part supports another against all strains, that it is naturally water proof and can scarcely be found it is so accurately made, and that it is so strong that it will hold a wheel without cement. The hoop is next placed in an automatic lathe and turned to its perfect and finished form. The valve hole and spoke holes are then drilled and the rim submersed in hot oil for an hour, after which it is made up into the wheel. The line of machines consist of No. 300 complete, weighing from  $27\frac{1}{4}$  to 28 pounds, according to pedals used; No. 300 stripped, weighing  $25\frac{1}{4}$  to 26 pounds; No. 301, weighing from  $26\frac{1}{4}$  to 29 pounds, stripped or complete, with brake, guards, rat trap or rubber pedals, and No. 302 ladies', weighing  $27\frac{1}{4}$  pounds. The wheels all list \$135.

#### Escutcheon for Jackson Latches.

The accompanying cut represents an escutcheon offered by the Miller Lock Company, Frankford, Philadelphia, Pa. The escutcheon is used with their line of



Escutcheon for Jackson Latches.

Jackson Colonial latches, an illustrated description of which was given in *The Iron Age* April 12, 1894. The design of the escutcheon is the result of a competitive effort made by the pupils of the School of Industrial Arts of the Pennsylvania Museum, at Philadelphia. More than 100 designs were prepared, but the prize was awarded to Carl J. Anderson, formerly a resident of Des Moines, Iowa. At the end of his first year he was awarded the Henry Perry Leland prize, a prize which is awarded annually for the best work in pen and ink drawing.

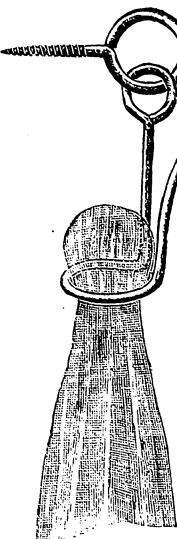
#### Yates' Astringent Lacquer.

Yates & Co., Rockford, Ill., refer to their astringent lacquer as soluble, adhesive, tenacious and rust proof, and as proving a valuable acquisition to the stove dealer in making stove polish, rust proof varnish, rust proof roof paint, &c. The manufacturers state that upon application they will be pleased to mail to any dealer a pamphlet telling

how to make a benzine paste stove polish at from 3 to 6 cents per pound that will prove a rust proof application and a durable jet black luster.

#### Redfield's Towel Holder.

J. R. Clancy, Syracuse, N. Y., is introducing the towel holder shown here-with. It consists of a wire, bent in the shape shown in the cut, attached at the top to a screw eye. A marble is put in



Redfield's Towel Holder.

the ring at the bottom of the hanger inside the towel, preventing the towel from coming out of the holder and from being cut. The holder is designed for use in bar rooms, barber shops, bath rooms, hotel wash rooms, kitchens, &c., and can also be utilized in draping flags or emblems, displaying dry goods, hanging lace and other curtains, portieres and mosquito nets.

#### Graphite Cycle Lubricant.

The Joseph Dixon Crucible Company, Jersey City, N. J., are putting a cycle chain graphite on the market, put up in screw top tin boxes. It is explained that the graphite is of the choicest stock, ground to an impalpable powder, and then ground with a high grade of lubricating oil. It is stated that this material, when applied to the chain of a bicycle, penetrates the bearings and thoroughly lubricates and protects them from wear and rust. The company will soon put the same material on the market in the form of a solid stick for the convenience of wheelmen who wish to carry it in their tool bags.

#### Bicycle Pumps.

The Bishop & Babcock Company, Cleveland, Ohio, with branches at 152 Centre street, New York, and 199 Washington street, Chicago, are offering five styles of bicycle pumps. The compound automatic hydraulic air compressor is attached to the water system to automatically keep up any desired pressure in the air storage tank. Tires can be inflated, it is stated, to any degree of hardness up to 80 to 100 pounds pressure if desired. With the No. 34 double oscillating pump a pressure of 50 pounds can be maintained in the 30 gallon tank on which it is fastened. It is remarked that sufficient compressed air can be stored for inflating a large num-

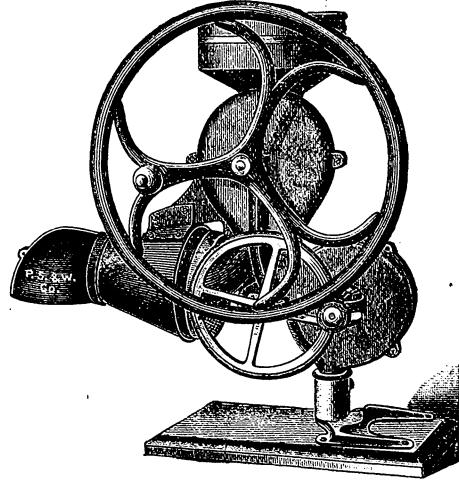
ber of tires, and that the pressure is always ready for inflating. The No. 54 pump is furnished with or without gauge, to exert a pressure of 50 pounds, and is designed for supply houses and owners of wheels. Pumps Nos. 100 and 101 are fitted with an inlet and outlet valve, and are designed to carry on the wheel.

#### Ice Pick.

H. M. Norton & Co., Chester, Conn., are making a wood head ice pick, which is an improvement on the ordinary pattern. The blade is  $\frac{1}{8}$  inch in diameter and  $5\frac{1}{2}$  inches long, with a shoulder, under which is a brass ferrule to keep the blade from being forced into the head. The head is fitted with a malleable iron ring 1 inch deep, with a strap across the top let in flush and held in place with a countersunk screw. This is to prevent the head falling off, if the wood shrinks. The malleable bands are both gray iron and tinmed. Mr. Norton is also offering an ice chisel with points, fitted with the same style of head. An article recently brought out is a bell hanger's bit with twist drill point for boring through iron or other obstructions that may be encountered. They are made in  $\frac{1}{8}$ ,  $\frac{1}{4}$ ,  $\frac{5}{16}$  and  $\frac{3}{8}$  diameters, and lengths of 12, 18, 24, 30 and 36 inches. W. W. Pryor & Co., 81 Chambers street, have the sale of the goods in this territory.

#### Almond and Peanut Sheller.

The Peck, Stow & Wilcox Company, 27 Chambers street, New York, are manufacturing an almond and peanut sheller, as here illustrated. The nuts are fed into a sheet iron hopper, 7 inches in diameter. The fly wheel, 15 inches across, revolves a simple piece of mechanism for crushing the shells. Passing downward the mass is met by a current of air produced by a three-bladed fan located in the casing directly over the standard. Passing



Apparatus for Shelling Peanuts, Almonds, &c.

through into a revolving tinned wire cloth cylinder of about  $\frac{1}{4}$  inch mesh, which turns within the jacket seen in the cut at the left, the kernels drop backward into a receptacle placed to receive them, while the shells are blown forward through the spout. The several wheels are rubber tired to promote friction. The apparatus is tastefully gotten up, being painted red and black with the bright portions nickelated. The sheller is 20 inches high.

# Current Hardware Prices.

APRIL 18, 1894.

**Note.**—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers' name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobber, at the figures named.

The character  $\circ$  is used to indicate a range of price; thus discount 50% to 50% and 10% signifies that the goods in question are sold at prices ranging from discount 50% and 10% to discount 50% and 10% and 5%.

## Adjusters, Blind—

Domestic,  $\frac{1}{2}$  doz. 83¢@83¢+10%  
Excelsior,  $\frac{1}{2}$  doz. 10.00... 50¢@10¢  
North's,  $\frac{1}{2}$  list net 10%  
Zimmerman's—See Fasteners, Blind.

## Ammunition—See Caps, Cartridges, Shells, &c.

## Anvils—

### American—

Eagle Anvils,  $\frac{1}{2}$  b. 9s... 16¢@15¢  
Horse shoe brand, Wrought... 11¢@11¢  
Moore & Barnes Mfg. Co. 35¢@35¢

### Imported—

Armitage Mouse Hole, 10¢@10¢  
S. & H., machine finished, 10¢@11¢  
Trenton, 10¢@10¢  
Wilkinson's, 10¢@11¢  
Peter Wright's, 11¢@11¢

## Anvil Vise and Drill—

Allen Anvil and Vise \$3.00... 40¢@10%  
Chester Anvil and Vise, 25¢  
Millers Falls Co., \$18.00... 20¢  
Star, 45¢@45¢

## Apple Parers—See Parers, Apple, &c.

## Augers and Bits—

Boring Machine Augers, 70¢@70¢+10%  
Car Bits, 12-in. twist, 50¢  
Common Augers and Bits, 70¢@70¢+10%  
Cincinnati Bell-Hangers' Bits, 30¢@10%  
Forstner Pat., Auger Bits, 15¢  
Jennings' Pattern Car Bits, 40¢  
Jennings' Pattern Auger Bits, 60¢  
C. E. Jennings & Co., No. 10, extension  
tip, 40¢  
C. E. Jennings & Co., No. 30, 40¢  
C. E. Jennings & Co., Auger Bits, 7¢ set  
92¢ quarters, No. 5, 5¢; No. 10, 25¢@25¢  
Russell Jennings' Augers and Bits, 25¢@25¢+10%  
Lewis' Patent Single twist, 45¢  
L'Hommedieu Car Bits, 15¢@10%  
Pugh's Black, 20¢  
Pugh's Jennings Pattern, 30¢  
Snell's Bits, 60¢@60¢@10%  
Snell's, for wood (wood list), 30¢@30¢@25%

## Bit Stock Drills—

Cleveland, 50¢@10¢@25%  
Cincinnati, for wood, 30¢@30¢@25%  
Cincinnati, for metal, 30¢@30¢@25%  
Morse Twist Drills, 45¢@10%  
New Process Twist Drill Co., 50¢@10¢@25%  
Standard, 50¢@10¢@25%  
Texas Star, 50¢@10¢@25%  
Syracuse, for metal, 30¢@10%  
Syracuse, for wood (wood list), 30¢@30¢@25%

## Expansive Bits—

Clark's small, \$18; large, \$26. 35¢@35¢+10%  
Ives' No. 4, 7¢ doz. 60¢... 40¢  
Stear's, No. 1, \$20. No. 2, 18... 35¢@35¢  
Stearns' No. 2, 28... 20¢  
Swan's, 40¢

## Gimlet Bits—

Bee, 25¢@25¢@25%  
Common, 7¢ gross \$2.75@25¢  
Diamond, 7¢ doz. \$1.25... 40¢@10%  
Double Cut:—  
C. Valley Mfg. Co., 30¢@10%  
Hartwell's, 7¢ gro. \$10.00... 40¢@10%  
Donglass, 7¢ doz. 40¢@10%  
Ives, 60¢@60¢@10%  
Shepardson's, 30¢@30¢@10%

## Hollow Augers—

Bonney's Adjustable, 7¢ doz. 45¢... 50%  
Cincinnati Adjustable, 25¢@10%  
Cincinnati Standard, 25¢@10%  
Douglas', 33¢@33¢@10%  
French, Swift & Co. (Beecher), 33¢@33¢@10%  
Ives', 33¢@33¢@10%  
Ives' Expansive, each \$4.50... 50¢@50%  
Stearns', 20¢@10%  
Universal Expansive, each \$4.50... 20¢  
Wood's, 25¢@25¢@10%

## Ship Augers and Bits—

L'Hommedieu's, 15¢@10¢@10¢@25%  
Snell's, 25¢@25¢@10%  
Snell's Ship Auger Pattern Car Bits, 15¢@10¢@10¢@25%  
Watrous', 35¢@25¢@10%

## Awl Hafts—See Hafts, Awl.

## Awls—

Brad, Handled, 7¢ gr. \$2.50@3.00  
Brad, Shouldered, 7¢ gr. \$1.30@3.10  
Peg, Pat., 7¢ gr. 35¢@38¢  
Peg, Should., 7¢ gr. \$1.50@3.55  
Scratch, Handled, 7¢ gr. \$1.50@3.55  
Scratch, Socket, 7¢ doz. \$1.10@3.20

## Awl and Tool Sets—See Sets, Awl and Tool.

## Axes—

First quality, best brands... 6.00@6.50  
First quality, other brands... 5.50@6.00  
Bevelled add 50¢  $\frac{1}{2}$  doz.

## Axle Grease—See Grease, Axle.

## Axes—

No. 1, 34¢@4¢; 4¢@5¢  
Nos. 7 to 14, 70¢  
Nos. 15 to 28, 47¢  
Nos. 19 to 22, 70¢  
Concord Axes, loose collar, 8¢ cash  
Concord Axes, solid collar, 4¢@5¢  
Concord Axes, 5¢@6¢

## Bag Holders—See Holders, Bag.

## Balances—

### Sash—

Caldwell, low list, 30¢  
Fullman, 60¢

### Spring—

Spring Balances, 40¢@40¢@10%  
No. 200, 20¢@30¢

Chatillon, 7¢ doz. 0.80 0.95 1.75 20¢  
Chatillon Straight Balances, 40¢@40¢@10%  
Chatillon Circular Balances, 50¢@10%

## Barb Wire—See Wire, Barb.

## Bars—

### Crow—

Cast Steel, 7¢ b. 34¢@36¢  
Iron, Steel Points, 7¢ b. 24¢@24¢

## Basins, Wash—

Standard Fibervare, No. 1, 10¢-in., \$1.80;  
12-inch, \$2.00; 15¢-inch, \$2.50; 15-inch,  
\$3.00.

## Beams, Scale—

Scale Beams, List Jan. 12, '82. 60¢@10%  
60¢@10¢@25%

Chatillon's No. 1, 40¢  
Chatillon's No. 2, 50¢@10¢@50¢@10%  
Custer's, 33¢@33¢

## Beaters—

### Egg—

Bryant's, \$ gross \$14.00  
Double (H. & R. Mfg. Co.), \$ gro. No. 0,  
\$12.00; No. 1, \$15.00; No. 2, \$18.00

Dover, 7¢ doz. \$1.00@1.20

Dover (Standard Co.), 7¢ doz \$1.00

Duplex (Standard Co.), 7¢ doz \$1.00

Duplex Extra Heavy (Standard Co.),  
\$ doz \$3.50

Easy (H. & R. Mfg. Co.), \$ gro. \$12.00

Improved Acme (H. & R. Mfg. Co.),  
\$ gro. \$9.00

Silver & Co., 7¢ doz \$5.50

Spiral, 7¢ gro. \$2.25@ \$4.50

Triple (H. & R. Mfg. Co.), 7¢ gro. \$16.50

## Cullinary—

Keystone, P. D. & Co., Each, No. 1, \$1;  
No. 2, \$2

## Bells—

### Cow—

Common Wrought, 60¢@10%  
Kentucky Durham, 70¢@10%  
Kentucky, Sargent's list, 70¢@10%  
Kentucky, "Star", 20¢@10%  
Standard, 50¢@10¢@25%  
Western, Sargent's list, 70¢@10%

## Door—

Crank, Brooks, 50¢@10¢@25%

Crank, Cone's, 50¢@10¢@25%

Crank, Connel's, 50¢@10¢@25%

Gong, Abbe's, 50¢@10¢@25%

Gong, Barton's, 40¢@10¢@25%

Gong, Yankee, 45¢@10¢@25%

Lever, R. & E. Mfg. Co.'s, 50¢@10¢@25%

Lever, Sargent's, or Nickel or Plated, 60¢@10%  
Lever, Taylor's, or Japanned, 25¢@10%

Pull, Brook's, 50¢@10¢@25%

## Electric—

Bigelow & Dowse, 20¢@20¢@10%  
Wollensak's, 20¢@20¢@10%

## Hand—

Extra Heavy Brass, 70¢@10¢@25%  
Light Brass, 70¢@10¢@25%  
Silver Chime, 33¢@10%  
White, 70¢@10¢@25%

Globe Cone's Patent, 25¢@10¢@25%

## Miscellaneous—

Call, 45¢@50¢

Farm Bells, 7¢ gro. \$3.50@3.50

Steel Alloy Church and School Bells, 40¢

## Belting, Rubber—

Common Standard, 75¢@75¢@10%

Extra, 60¢@10¢@20¢@10%  
Standard, 70¢@70¢@10%  
N.Y.E. & P. Co., Carbon, 60¢@60¢@5%

N.Y.E. & P. Co., Diamond, 50¢@50¢@5%

N.Y.E. & P. Co., Para, 40¢@40¢@5%

## Bench Stops—See Stops, Bench

## Benders and Upsetters, Tire—

Detroit Perfected Tire Bender, 15¢

Green River Tire Benders and Upsetters, 20¢

Stoddard's Lightning Tire Upsetters, 15¢

## Bits—

Anger, Gimlet, Bit Stock Drills, &c.,  
see Augers and Bits.

## Bit Holders—See Holders.

## Blind Adjusters—See Adjusters, Blind.

## Blind Fasteners—See Fasteners, Blind.

## Blind Staples—See Staples, Blind.

## Blocks—

Cleveland Block Co., Mai. Iron, 50¢@10¢@25%

Moore's Novelty Mai. Iron, 50¢

Surf Grip Steel Tackle Blocks, 25¢

See also Machines, Housing.

## Bolts—

### Carriage, Machine, &c.—

Com. list June 10, '84... 80¢@10¢@80¢@10%  
Genuine Eagle, Norway, list Oct. '84...  
80¢@10¢@80¢@10%

Eagle, Norway, list Oct. '84@10¢@80¢@10%  
R. B. & W., old list, 70¢

Bolt Ends, list Jan. 1, 1890. 80¢@10¢@80¢@20%  
Machine, list Jan. 1, 1890. 80¢@10¢@80¢@20%

## Cast Iron—

Fast Joint, Broad, 60¢@60¢@5%

Fast Joint, Narrow, 60¢@60¢@5%

Loose Joint, Japanned, 60¢@60¢@5%

Loose Pin, Acorns, 75¢@10¢@80¢@10%

Loose Pin, Acorns, Japanned, 75¢@10¢@80¢@10%

Plated Tips, Mayer's Hinges, Parliament Buttons, 75¢@10¢@80¢@10%

## Door and Shutter—

Cast Iron Barrel, Square, &c., 75¢@10%

Cast Iron Chain (Sargent's list):  
65¢@10¢@65¢@10%  
Wrought Barrel, 75¢@75¢@10%

Wrought Barrel, 65¢@70¢@10%

W. B. K. Flush, Common, 65¢@10%

W. B. Shutter, Cast Knob, 60¢@10¢@60¢@10%

W. B. Shutter, Sargent's list, 60¢@10%

W. B. Shutter, all Iron, Stanley's, 60¢@10¢@60¢@10%

## Door and Shutter—

Cast Iron Barrel, Square, &c., 75¢@10%

Cast Iron Chain (Sargent's list):  
65¢@10¢@65¢@10%  
Wrought Barrel, 75¢@75¢@10%

Wrought Barrel, 65¢@70¢@10%

W. B. K. Flush, Common, 65¢@10%

W. B. Shutter, Cast Knob, 60¢@10¢@60¢@10%

W. B. Shutter, Sargent's list, 60¢@10%

W. B. Shutter, all Iron, Stanley's, 60¢@10¢@60¢@10%

## Door and Shutter—

Cast Iron Barrel, Square, &c., 75¢@10%

Cast Iron Chain (Sargent's list):  
65¢@10¢@65¢@10%  
Wrought Barrel, 75¢@75¢@10%

Wrought Barrel, 65¢@70¢@10%

W. B. K. Flush, Common, 65¢@10%

W. B. Shutter, Cast Knob, 60¢@10¢@60¢@10%

W. B. Shutter, Sargent's list, 60¢@10%

W. B. Shutter, all Iron, Stanley's, 60¢@10¢@60¢@10%

## Door and Shutter—

Cast Iron Barrel, Square, &c., 75¢@10%

Cast Iron Chain (Sargent's list):  
65¢@10¢@65¢@10%  
Wrought Barrel, 75¢@75¢@10%

Wrought Barrel, 65¢@70¢@10%

W. B. K. Flush, Common, 65¢@10%

W. B. Shutter, Cast Knob, 60¢@10¢@60¢@10%

W. B. Shutter, Sargent's list, 60¢@10%

W. B. Shutter, all Iron, Stanley's, 60¢@10¢@60¢@10%

## Door and Shutter—

Cast Iron Barrel, Square, &c., 75¢@10%

Cast Iron Chain (Sargent's list):  
65¢@10¢@65¢@10%  
Wrought Barrel, 75¢@75¢@10%

Wrought Barrel, 65¢@70¢@10%

W. B. K. Flush, Common, 65¢@10%

W. B. Shutter, Cast Knob, 60¢@10¢@60¢@10%

W. B. Shutter, Sargent's list, 60¢@10%

W. B. Shutter, all Iron, Stanley's, 60¢@10¢@60¢@10%

## Door and Shutter—

Cast Iron Barrel, Square, &c., 75¢@10%

Cast Iron Chain (Sargent's list):  
65¢@10¢@65¢@10%  
Wrought Barrel, 75¢@75¢@10%

Wrought Barrel, 65¢@70¢@10%

W. B. K. Flush, Common, 65¢@10%

W. B. Shutter, Cast Knob, 60¢@10¢@60¢@10%

W. B. Shutter, Sargent's list, 60¢@10%

W. B. Shutter, all Iron, Stanley's, 60¢@10¢@60¢@10%

## Door and Shutter—

Cast Iron Barrel, Square, &c., 75¢@10%

Cast Iron Chain (Sargent's list):  
65¢@10¢@65¢@10%  
Wrought Barrel, 75¢@75¢@10%

<b>Chalk Lines</b> —See Lines.	
<b>Checks, Door</b> .....	50¢
<b>Chisels</b> —	
<b>Socket Framing and Firmer Mix.</b> .....	50¢
Ohio Tool Co. ....	75¢ to 80¢
F. S. & W. ....	30¢
Wetherby ....	30¢
Buck Bros. ....	30¢
Charles Buck ....	30¢
Butchers' ....	30¢
Spear & Jacksons' ....	4¢ to 2¢
Tanged Firmer, ...	50¢ to 60¢ to 10¢ & 15¢
L. & J. White. ....	30¢ to 30¢ to 10¢
<b>Tanged and Miscellaneous</b> ....	30¢
Buck Bros. ....	30¢
Charles Buck ....	30¢
Butchers' ....	4¢ to 5¢ to 10¢
Spear & Jacksons' ....	5¢ to 2¢
Tanged Firmer, ...	50¢ to 60¢ to 10¢
Cold Chisels, fair quality, ...	14¢ to 16¢
<b>Chucks</b> —	
Beach Pat. .... each, \$8.00. ....	20¢
Danbury .... each, \$6.00. ....	30¢ to 35¢
Graham Patent. ....	30¢
Morse's Adjustable, each, \$7.00. ....	20¢ to 25¢
Syracuse, Balz Pat. ....	25¢
Skinned Patent Chucks. ....	
Combination Lathe Chucks. ....	33¢ to 1¢
Drill Chucks. ....	1¢
Independent Lathe Chucks. ....	40¢
Universal Lathe Chucks. ....	40¢
Union Mfg. Co. ....	40¢
Combination. ....	40¢
Independent. ....	40¢
Universal. ....	40¢
Victor. ....	88.50, 25¢
<b>Churns</b> —	
M. Dernier's Star Barrel Churn, each 6 gal., \$2.60; 10 gal., \$2.75; 15 gal., \$3.00; 20 gal., \$3.25.	
Time Union, each, 6 gal. \$3.25; 7 gal., \$3.75; 10 gal., \$4.25.	
<b>Clamps</b> —	
Adjustable, Cincinnati. ....	15¢ to 10¢
Adjustable, Hammers. ....	15¢ to 15¢ & 30¢
Adjustable, Stearn's. ....	30¢ to 30¢ & 10¢
Barnes' Machinist's Clamps. ....	33¢ to 5¢
Cabinet Sargent's. ....	70¢ to 10¢
Carpenter's, Cincinnati. ....	25¢ to 10¢
Carriage Makers', P. S. W. Co. ....	40¢ to 10¢
Carriage Makers', Sargent's. ....	75¢ to 15¢ & 25¢
Eberhard Mfg. Co. ....	40¢ to 10¢ to 15¢
Joiners' Clamps, Troughton's. ....	25¢ to 10¢
R. I. Tool Co.'s, Wrought Iron. ....	25¢
Saw Clamps, see Vises, Saw Fliers.	
Stearn's Malleable, with Wrought Iron Screw. ....	75¢ to 5¢ & 25¢
Warner's. ....	40¢ to 10¢ to 10¢ & 25¢
<b>Cleavers, Butchers</b> —	
Beatty's. ....	40¢ to 40¢ & 5¢
Bradley's. ....	25¢ to 30¢
Foster Bros. ....	30¢
New Haven Edge Tool Co.'s. ....	40¢
Nichols Bros. ....	30¢
P. S. & W. ....	33¢ to 8¢ to 33¢ & 10¢
Schulte, Lohoff & Co. ....	40¢ to 40¢ & 25¢
L. & J. White. ....	20¢ & 5¢
<b>Clips</b> —	
Baker Axe Clips. ....	25¢
Norway, Axle & 5-16. ....	55¢ to 5¢ & 30¢
Norway Spring Bar Clips, 5-16. ....	60¢ to 5¢ & 25¢
2d grade Norway Axle & 5-16. ....	65¢ to 5¢ & 25¢
Steel Felloe Clips. ....	5¢, 1¢, 25¢
Superior Axle Clips. ....	70¢
Wrought Iron Felloe Clips. ....	5¢, 1¢, 25¢
<b>Cloth and Netting, Wire</b> —	
—See Wire, &c.	
<b>Cockeyes</b> .....	50¢
<b>Cocks, Brass</b> —	
Hardware list (Globe, Kerosene, Lever Bibbs, Racking, &c.). ....	60¢ to 20¢ to 10¢
<b>Coffee Mills</b> —See Mills, Coffee.	
<b>Collars, Dog</b> —	
Brass, Pope & Stevens' list. ....	40¢
Chapman's, Pope & Stevens' list. ....	40¢
Embossed GHF, Pope & Stevens' list. ....	30¢ to 15¢
Leather, Pope & Stevens' list. ....	40¢
Medford Fancy Goods Co. ....	40¢ to 10¢ to 50¢
<b>Combs, Curry</b> —	
American Curry Comb Co. ....	33¢ to 40¢
Pitcher Mfg. Co. ....	50¢ to 10¢ to 50¢ to 10¢
Gill's Magnetic. ....	5¢ to 20¢
Kohler's Ultimate. ....	5¢ to 20¢
Kohler's Magic Oscillating. ....	5¢ to 20¢
Rubber, per doz., \$10.00. ....	25¢
<b>Compasses, Dividers, &amp;c.</b> —	
Compasses, Calipers, Dividers. ....	70¢ to 10¢ to 75¢
Bends & Call Co.'s	
Dividers. ....	50¢
Calipers, Call's Patent Inside. ....	65¢
Calipers, Double. ....	65¢
Calipers, Outside or Outside. ....	65¢
Calipers, Wing. ....	65¢
Compasses. ....	50¢ & 5¢
Excelsior. ....	50¢
Starrett's	
Combination Dividers. ....	25¢
Lock Calipers and Dividers. ....	25¢
Spring Calipers and Dividers. ....	25¢ to 10¢
Stevens & Co.'s. ....	26¢ to 10¢
<b>Coolers, Water</b> —	
S. S. & Co. ....	2 gal., \$2.00; 3 gal., \$2.50; 4 gal., \$2.75; 5 gal., \$3.00 each. ....
<b>Coopers' Tools</b> —	
—See Tools, Coopers.	
<b>Cord</b> —	
Sash—	
Braided, Crown Drab and Fancy, 1 lb., 55¢. ....	30¢
Braided, Crown White, 1 lb., 50¢. ....	50¢
Cable Laid Italian Sash. ....	1 lb., 10¢ to 20¢
Common. ....	1 lb., 8¢ to 9¢
Common, Russia Sash. ....	1 lb., 12¢ to 13¢
Egyptian, India Hemp, Braided. ....	26¢
India Cable Laid Sash. ....	1 lb., 11¢ to 12¢
Massachusetts, White. ....	22¢ to 24¢
Ossawam Mills—	
Braided, Giant, Drab and Fancy, 1 lb., 55¢. ....	25¢
Braided, Giant, White, 1 lb., 30¢. ....	20¢
Patent, good quality. ....	1 lb., 10¢ to 11¢
Patent Russia Sash. ....	1 lb., 18¢ to 14¢
Samson's	
Braided, Drab Cotton. ....	1 lb., 42¢
Braided, Italian Hemp. ....	1 lb., 40¢
Braided, Linen. ....	1 lb., 56¢
Braided, White Cotton. ....	1 lb., 37¢
Simpson's, Idem, Braided, White. ....	26¢
Silver Lako—	
A quality, Drab, 55¢. ....	25¢
A quality, White, 50¢. ....	25¢
B quality, Drab, 50¢. ....	20¢
B quality, White, 50¢. ....	20¢
Sylvan Spring, Extra Braided, Drab. ....	39¢
Sylvan Spring, Extra Braided, White. ....	34¢
Tate's Solid Braided Economy, Drab. ....	27¢
Economy, White. ....	28¢
Hercules, Drab. ....	30¢
Hercules, White. ....	25¢
White Cotton Braided, fair. ....	2¢ to 24¢
Wire Picture—	
Braided or Twisted. ....	80¢ to 80¢ to 15¢
Corkscrews—	
See Screws, Cork.	
Corn Knives and Cutters—	
See Knives, Corn.	
Crackers, Nut—	
Acme. ....	
Japanned, 1 lb. gro. ....	50¢
Nickel Plated, 1 lb. gro. ....	10¢
Blake's Pattern, 1 lb. doz. ....	10¢
Table (H. & B. Mfg. Co.) ....	10¢
Turner & Seymour Mfg. Co. ....	10¢
Cradles—	
Grain. ....	50¢ & 2¢ to 50¢ & 5¢
Crayons—	
White Crayons, 1 lb. gross. ....	70¢ to 8¢
D. M. Stewart Mfg. Co. ....	
Metal Workers' 1 lb. gross, \$2.50. ....	25¢
Railroad. ....	2.00. ....
Rolling Mill. ....	2.50. ....
Soapstone Pencils, 1 lb. gross. ....	25¢
See also Chalk.	
Creamery Pails—	
See Pails, Creamery.	
Crow Bars—	
See Bars, Crow.	
Curry Combs—	
See Combs, Curry.	
Cutters—	
Meat—	
American. ....	30¢
Nos. ....	1 2 3 4 5
Each. ....	\$5 \$7 \$10 \$25 \$50
Enterprise. ....	30¢
Nos. ....	10 12 22 32 42
Each. ....	\$3 \$2.50 \$4 \$6 \$15
Dixon's. ....	30¢
Nos. ....	1 2 3
Draw Cut, each. ....	\$14.00 \$17.00 \$19.00 \$30.00
Nos. 5. ....	2 6 8
\$50 \$75 \$80 \$225. ....	20¢ to 25¢
Hale's, 1 lb. doz. ....	70¢
Nos. ....	11 12 13
\$27.00 \$33.00 \$45.00	
Home No. 1. ....	\$26.00. ....
Little Giant. ....	55¢ to 10¢
Nos. 305. ....	\$10 \$12 \$20 \$32
\$35.00 \$48.00 \$44.00 \$72.00 \$68.00	
Miles' Challenge. ....	45¢ to 45¢ & 10¢
Nos. ....	1 2 3
\$22.00 \$30.00 \$40.00	
Triumph No. 505. ....	\$21.00. ....
Woodruff's. ....	40¢ to 40¢ & 25¢
Nos. ....	100 150
\$15.00 \$18.00	
Chadborn's Smoked Beef Cutter, 1 lb. doz. ....	\$66.00
Enterprise Beef Shavers. ....	20¢
Slaw and Kraut—	
Tucker & Dorsey Mfg. Co. ....	
Kraut Cutters. ....	40¢
Slaw Cutters, 1 Knife, 1 lb. gross. ....	\$21.00
Slaw Cutters, 2 Knives, 1 lb. gross. ....	30.00
Tobacco—	
Acme. ....	1 lb. doz. \$20.00 40¢
All Iron. ....	1 lb. doz. \$2.50 35¢
Champion. ....	20¢ to 30¢
Nashua Lock Co.'s. ....	1 lb. doz. \$18.00 50¢ to 55¢
National. ....	1 lb. doz. \$21.00 30¢
Sargent's. ....	1 lb. doz. \$24.00 55¢ to 80¢
Wilson's. ....	1 lb. doz. \$20.00
Washer—	
Acme. ....	1 lb. doz. \$20.00 40¢
All Iron. ....	1 lb. doz. \$2.50 35¢
Champion. ....	20¢ to 30¢
Nashua Lock Co.'s. ....	1 lb. doz. \$18.00 50¢ to 55¢
National. ....	1 lb. doz. \$21.00 30¢
Sargent's. ....	1 lb. doz. \$24.00 55¢ to 80¢
Wilson's. ....	1 lb. doz. \$20.00
Diggers, Post Hole, &c.—	
Cronk's Post Bars. ....	1 lb. doz. \$60.00
Eureka Diggers. ....	1 lb. doz. \$11.00 to \$12.75
Fletcher Post Hole Augers. ....	1 lb. doz. \$20.00 to \$21.00
Gem, Improved. ....	\$9.00 to \$10.00 net
Gibbs' Columbia. ....	1 lb. doz. \$12.00
Gibbs' Hustler. ....	1 lb. doz. \$10.00
Gibbs' Imperial. ....	1 lb. doz. \$7.50
Gibbs' National. ....	1 lb. doz. \$12.00
Gibbs' Post Hole Digger. ....	1 lb. doz. \$12.75
Kohler's Hercules. ....	1 lb. doz. \$14.00
Kohler's Invincible. ....	1 lb. doz. \$12.00
Kohler's Little Giant. ....	1 lb. doz. \$18.00
Kohler's New Champion. ....	1 lb. doz. \$8.00
Ryan's. ....	1 lb. doz. \$20.00, 10¢
Samson. ....	1 lb. doz. \$34.00. ....
Schedler. ....	1 lb. doz. \$18.00
Shimer's Hollow Handle. ....	1 lb. doz. \$24.00, 50¢
Vaughan's Post Hole Auger. ....	1 lb. doz. \$8.50 to \$9.50
Dividers—	
—See Compasses.	
Dog Collars—	
—See Collars, Dog.	
Door Checks—	
—See Checks, Door.	
Door Springs—	
—See Springs, Door.	
Drawers, Money—	
Money Drawers. ....	1 lb. doz. \$18 to \$22
Waddel's Improved. ....	1 lb. doz. \$15.00
Waddel's Improved. ....	No. 2, 2 lb. doz. \$18.00
Waddel's Comb, Cutlery Case and Alarm Bell. ....	\$12.50
Drawing Knives—	
—See Knives, Drawing.	
Drills and Drill Stocks—	
Bench Drills, Stearns. ....	each \$1.75
Blacksmith's Self Feeding, each \$1.75	
Blacksmith's Self Feeding, each \$1.75 to 2.00	
Automatic Boring Tools. ....	\$1.75 to \$1.85
Breast, Bartolomew's. ....	each \$2.50 to 4.00
Breast, Millers Falls. ....	each \$3.00 to 2.50
Breast, P. S. & W. ....	40¢ to 10¢
Breast, Wilson's. ....	30¢ to 5¢
Chilcope Automatic Drill. ....	20¢ to 25¢
Godeff's Automatic Drills. ....	40¢ to 40¢ to 40¢
Ratchet, Curtis & Curtis. ....	30¢
Ratchet, Ingersoll's. ....	30¢
Ratchet, Merrill's. ....	20¢ to 20¢ to 25¢
Ratchet, Moore's Triple Action. ....	25¢ to 30¢
Ratchet, Parker's. ....	20¢ to 20¢ to 25¢
Ratchet, Weston's. ....	20¢ to 25¢
Ratchet, Whitmey's. ....	20¢ to 10¢ to 10¢
Whitmey's Hand Drill, Plain. ....	\$11.00
Adjustable, \$12.00. ....	20¢ to 10¢
Twist Drills—	
Cleveland. ....	50¢ to 10¢ to 10¢
Diamond, W. & B. ....	50¢ to 10¢ to 10¢
Graham's Pat. Groove Shank. ....	50¢ to 10¢ to 10¢
Morse. ....	50¢ to 10¢ to 10¢
New Process. ....	50¢ to 10¢ to 10¢
Standard. ....	50¢ to 10¢ to 10¢
Syracuse (Metal list)....	50¢ to 10¢
Drill Bits or Bit Stock—	
Drill—	
—See Augers and Bits.	
Drill Chucks—	
—See Chucks.	
Dripping Pans—	
—See Pans, Dripping.	
Drivers, Screw—	
Allard's Spiral, new list. ....	25¢
Brace Screw Drivers. ....	25¢ & 10¢
Buck Bros. ....	30¢
Buck Bros., Screw Driver Bits. ....	25¢ & 10¢
Clark's Pat. ....	30¢ to 35¢
Cincinnati. ....	25¢ & 10¢
Dison's. ....	25¢ & 10¢
Douglas Mfg. Co. ....	20¢ to 20¢ & 10¢
Elliott's Socket and Ratchet. ....	25¢ & 25¢
Fray's Hol. H'dle Sets. ....	No. 3, \$12.00, 45¢
Gay & Parsons. ....	35¢
Goodell's Automatic. ....	50¢ to 10¢
Knap & Cowles. ....	25¢ & 10¢
No. 1. ....	70¢ to 10¢
No. 2. ....	70¢ to 10¢
No. 3. ....	60¢ to 10¢
Nos. 4 and 00, Acme and Ideal. ....	60¢ to 10¢
Phillips' Window Screen Frames. ....	50¢ to 50¢ to 50¢
Perter's Pat. Window and Door Frame. ....	25¢ to 25¢ to 25¢
Saw—	
Red, Polished and Varnished. ....	\$1.50, 25¢
White Vermont. ....	\$1.50, 25¢
Screen, Window and Door—	
Bonanza Window Screens. ....	50¢ to 50¢ to 50¢
Cortland. ....	40¢ to 40¢ to 40¢
Empire Fancy Screen Doors. ....	40¢ to 40¢ to 40¢
Phillips' Window Screen Frames. ....	50¢ to 50¢ to 50¢
Perter's Pat. Window and Door Frame. ....	25¢ to 25¢ to 25¢
Saw—	
Red, Polished and Varnished. ....	\$1.50, 25¢
White Vermont. ....	\$1.50, 25¢
Screen, Window and Door—	
Bonanza Window Screens. ....	50¢ to 50¢ to 50¢
Cortland. ....	40¢ to 40¢ to 40¢
Empire Fancy Screen Doors. ....	40¢ to 40¢ to 40¢
Phillips' Window Screen Frames. ....	50¢ to 50¢ to 50¢
Perter's Pat. Window and Door Frame. ....	25¢ to 25¢ to 25¢
Saw—	
Red, Polished and Varnished. ....	\$1.50, 25¢
White Vermont. ....	\$1.50, 25¢
Screen, Window and Door—	
Bonanza Window Screens. ....	50¢ to 50¢ to 50¢
Cortland. ....	40¢ to 40¢ to 40¢

<b>Halters—</b>
Covert's Adj. Rope Halters.....40 <sup>10</sup>
Covert's Adj. Web Halters.....50 <sup>10</sup>
Covert's Hemp Horse and Cattle Tie.....50 <sup>10</sup>
Covert's Jute Cattle Ties.....70 <sup>10</sup>
Covert's Jute Horses Ties.....70 <sup>10</sup>
Covert's Jute, 7 <sup>10</sup> in., Jute.....70 <sup>10</sup>
Covert's Rope, 1 <sup>10</sup> in., Hemp.....50 <sup>10</sup>
Covert's Rope, 1 <sup>10</sup> in., Hemp.....50 <sup>10</sup>
Covert's Saddlery Works Halters.....33 <sup>10</sup>
Covert's Saddlery Works Handy Web Halters.....33 <sup>10</sup>
Covert's Saddlery Works Horse and Cattle Ties.....33 <sup>10</sup>

**Hammers—****Handled Hammers—**

Atha Tool Co.....
Buffalo Hammer Co.....
Humason & Beckley.....50 <sup>10</sup>
Vetero.....
Cheney's Claw.....40 <sup>10</sup>
Cheney's Machine's & Riveting.....50 <sup>10</sup>
C. Hammond & Son.....40 <sup>10</sup>
Magnetic Tack, Nos. 1, 2, 3, 6 <sup>10</sup> , 1.50 & 1.75.....30 <sup>10</sup>
Maydole's, list Dec. 1, '88.....25 <sup>10</sup>
Nelson Tool Works.....40 <sup>10</sup>
Pack, Stow & Wilcox.....50 <sup>10</sup>
Payette R. Plumb.....
Artisan's Choice, A. E. Nall.....40 <sup>10</sup>
Horseshoe Turning Hammers.....50 <sup>10</sup>
Regular Y. & P. A. E. Nall.....50 <sup>10</sup>
Other Hammers.....50 <sup>10</sup>
Sargent's.....40 <sup>10</sup>
Warner & Nobles, new list.....25 <sup>10</sup>

**Heavy Hammers and Sledges—**

8 lb and under.....\$140 <sup>10</sup>
8 to 5 lb.....\$130 <sup>10</sup>
Over 5 lb.....\$130 <sup>10</sup>

Wilkinson's Smiths.....10<sup>10</sup>**Handcuffs and Leg Irons**

—See Police Goods.

**Handles—****Cross-Cut Saw Handles—**

Atkins', new list.....40 <sup>10</sup>
Champion.....15 <sup>10</sup>
Ely's Perfection.....\$1.00
Sensible.....40 <sup>10</sup>

**Iron, Wrought or Cast—**

Barn Door, \$1.40.....10 <sup>10</sup>
Bronze Iron Drop Latches, \$10 <sup>10</sup>
Chest and Lifting.....70 <sup>10</sup>
Door or Thumb.....

Nos. .... 0 1 2 3 4
Per doz.....\$0.90 1.00 1.08 1.35 1.50

Per doz.....\$0.90 1.00 1.08 1.35 1.50
80 <sup>10</sup> & 10 <sup>10</sup>

Jap'd Store Door Handles—Nuts, \$1.02 <sup>10</sup>
Plate, \$1.10; no plate, \$0.88.....net
Roggins' Latches.....\$1.00

Wood—
Anger, assorted.....\$1 gr 5.00 <sup>10</sup>
Auger, large.....\$1 gr 7.00 <sup>10</sup>
File, assorted.....\$1 gr 2.75 <sup>10</sup>
Brad Awl.....\$1 gr 2.00 <sup>10</sup>
Apple Firmer Chisel, ass'd.....\$1 gr 5.00 <sup>10</sup>
Apple Firmer Chisel, large.....\$1 gr 6.00 <sup>10</sup>
Hickory Firmer Chisel, ass'd.....\$1 gr 4.50 <sup>10</sup>
Hickory Firmer Chisel, large.....\$1 gr 5.00 <sup>10</sup>
Socket Firmer Chisel, ass'd.....\$1 gr 3.00 <sup>10</sup>
Socket Framing Chisel, ass'd.....\$1 gr 5.00 <sup>10</sup>
Chisel, Fibre Head.....33 <sup>10</sup>
Hammer, Hatchet, Axe, &c.....40 <sup>10</sup>
Hoe, Rake, Shovel, &c.....60 <sup>10</sup>
Pat. Auger, Douglass.....\$1 gr 6.00 <sup>10</sup>
Pat. Auger, Ives.....30 <sup>10</sup>
Pat. Auger, Swan's.....\$1 gr 1.00 <sup>10</sup>
Saw and Plane.....40 <sup>10</sup>
J. B. Smith & Co.'s Pat. File.....50 <sup>10</sup>

<b>Hangers—</b>
Barn Door, New England.....70 <sup>10</sup>
Barn Door, old patterns.....70 <sup>10</sup>
Bart., 50 <sup>10</sup>
Bent Anti-Friction.....60 <sup>10</sup>
Boss.....60 <sup>10</sup>
Carrier Steel Anti-Friction.....50 <sup>10</sup>
Champion.....60 <sup>10</sup>
Chicago Anti-Friction.....30 <sup>10</sup>
Olimax Anti-Friction.....55 <sup>10</sup>
Cincinati Nos. 1, 22 <sup>10</sup> ; 2, 25 <sup>10</sup> ; 3, 25 <sup>10</sup> ; 4, 25 <sup>10</sup>
Crescent.....60 <sup>10</sup>
Cronk's Patent, Steel Covered.....50 <sup>10</sup>
Duplex (Wood Track).....60 <sup>10</sup>
Economy, \$6.00.....50 <sup>10</sup>
Hamilton Wrought Steel Track.....55 <sup>10</sup>
Interstate.....50 <sup>10</sup>
Kidder's.....50 <sup>10</sup>
Lane's New Standard.....60 <sup>10</sup>
Lane's Parlor.....40 <sup>10</sup>
Lane's Standard.....60 <sup>10</sup>
Lundy, Steel Parlor.....40 <sup>10</sup>
Magic.....40 <sup>10</sup>
Matchless.....50 <sup>10</sup>
Moody.....40 <sup>10</sup>
Moore's Baggage Car Door.....33 <sup>10</sup>
Moore's Elevator.....33 <sup>10</sup>
Moore's Railroad.....55 <sup>10</sup>
Nickel, Steel, Nos. 0, 25 <sup>10</sup> ; 1, 30 <sup>10</sup> ; 2, 35 <sup>10</sup>
Orleans Steel.....55 <sup>10</sup>
Paragon Nos. 5, 54 <sup>10</sup> ; 7 and 8.....20 <sup>10</sup>
Pendulum, Payson's.....40 <sup>10</sup>
Perfection.....50 <sup>10</sup>
Richards'.....30 <sup>10</sup>
Samson Steel Anti-Friction.....55 <sup>10</sup>
Stearns' Anti-Friction.....20 <sup>10</sup>
Stearns' Challenge.....25 <sup>10</sup>
Sterling.....50 <sup>10</sup>
Terry's Ideal.....50 <sup>10</sup>
Terry's Modern.....50 <sup>10</sup>
Terry's Shield.....50 <sup>10</sup>
Terry's Solid.....50 <sup>10</sup>
Terry's Wrought Single Strap.....50 <sup>10</sup>
Victor, No. 1, \$15.00; No. 2, \$16.50; No. 3, \$18.00.....50 <sup>10</sup>
Warner's Pat.....20 <sup>10</sup>
Wind West.....55 <sup>10</sup>
Zenith for Wood Track.....55 <sup>10</sup>

<b>Harness Snaps—</b> —See Snaps.
-----------------------------------

<b>Hatchets—</b>
------------------

American Axe and Tool Co.
Blood's.....
Hunt's.....40 & 10
Hurd's.....@ 10
Math's.....40 & 10
Underhill's & Son.....65 <sup>10</sup>
G. Hammond & Son.....
Fayette R. Plumb.....
Collins.....10 <sup>10</sup>
Bufilet Hammer Co.....
Kelly's.....50 @ 50
P. S. & W. Co.....50 @ 50
Sargent's & Co.....50 @ 50
Schulte, Lohoff & Co.....\$10 <sup>10</sup>
Ten Eyck Edge Tool Co.....

**Hay and Straw Knives**

—See Knives.

**Hinges—****Blind Hinges—**

Clark's, Nos. 1, 3, 5, 1888, Old Pattern
Nos. 1, 3, 5, 10 <sup>10</sup>
Nos. 1 and 3, Tip Pattern.....75 & 10 <sup>10</sup>
No. 50, Buffalo Noiseless, 40, 60 & 65 <sup>10</sup>
Buffalo Reversible, Nos. 3, 2, 14, 16, 18 & 20 <sup>10</sup>
No. 1, Cottage, for wood only.....80 <sup>10</sup>
Dixie L. & P., Nos. 3, 2 <sup>1/2</sup> , 1 <sup>1/2</sup> , 1, 0 & 1 <sup>1/2</sup> .....75 & 5 <sup>10</sup>
No. 25, Empire Reversible.....75 & 10 <sup>10</sup>
Lull & Porter, Nos. 3, 2 <sup>1/2</sup> , 1 <sup>1/2</sup> , 1, 0 & 1 <sup>1/2</sup> .....75 & 10 <sup>10</sup>
Morse Gravity, Nos. 2, 4, 4 <sup>1/2</sup> , 8, 8 <sup>1/2</sup> & 10.....75 & 10 <sup>10</sup>
Huffer.....50 <sup>10</sup>
North's Automatic Blind Fixtures, No. 1, for Wood, \$3.00; No. 3, for Brick, \$11.50.....10 <sup>10</sup>
Reading's Gravity.....75 & 10 <sup>10</sup>
Sargent's Nos. 1, 3, 5, 11, 12, 13.....75 & 10 <sup>10</sup>

**Gate Hinges—**

Automatic.....\$1.25, 50 <sup>10</sup>
Clark's, Nos. 1, 2, 3, 8.....60 & 10 <sup>10</sup>
N. E. Reversible.....\$1.25, 50 <sup>10</sup>
N. E. Reversible.....\$1.25, 50 <sup>10</sup>
Western.....\$1.20, 50 <sup>10</sup>

**Spring Hinges—**

Acme.....30 <sup>10</sup>
American.....20 <sup>10</sup>
Bardsley's Patent Checking.....15 <sup>10</sup>
Barker's Double Acting.....25 <sup>10</sup>
Bommer's Japanned.....35 <sup>10</sup>
Bommer's All other Kinds.....30 <sup>10</sup>
Buckman's.....15 <sup>10</sup>
Champion.....60 <sup>10</sup>
Chicago.....30 <sup>10</sup>
Columbia.....20 <sup>10</sup>
Crown.....20 <sup>10</sup>
Devore, No. 1.....\$1.00, 13 <sup>10</sup>
Freeport.....\$1.00, 12 <sup>10</sup>
Gear's Spring and Blank Butts.....4 <sup>10</sup>
Gem.....20 <sup>10</sup>
New Idea.....\$1.00, 12 <sup>10</sup>
New Idea No. 2.....\$1.00, 18 <sup>10</sup>
New Idea Dbl. Acting.....45 <sup>10</sup>
No. 10 Matchless.....60 <sup>10</sup>
No. 25 Unbreakable.....60 <sup>10</sup>
Reliable.....20 <sup>10</sup>
Rex.....\$1.00, 13 <sup>10</sup>
Royal.....60 <sup>10</sup>
Samsom.....60 <sup>10</sup>
Stearns' Noiseless Floor Hinge, 20 & 24 <sup>10</sup>
Surprise.....\$1.00, 12 <sup>10</sup>
New Idea No. 1.....\$1.00, 18 <sup>10</sup>
New Idea No. 2.....\$1.00, 20 <sup>10</sup>
Stearns' Noiseless Floor Hinge, 20 & 24 <sup>10</sup>
Surprise.....\$1.00, 12 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 18 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 20 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 24 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 28 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 32 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 36 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 40 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 44 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 48 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 52 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 56 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 60 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 64 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 68 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 72 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 76 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 80 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 84 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 88 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 92 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 96 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 100 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 104 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 108 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 112 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 116 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 120 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 124 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 128 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 132 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 136 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 140 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 144 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 148 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 152 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 156 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 160 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 164 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 168 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 172 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 176 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 180 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 184 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 188 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 192 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 196 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 200 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 204 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 208 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 212 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 216 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 220 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 224 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 228 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 232 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 236 <sup>10</sup>
W. & G. Stearns'.....\$1.00, 240 <sup>10</sup>
W. & G. Stearns'.....\$1.

Plate	884 & 2%	
Romer's Night Latches	15%	
R. & E. Mfg. Co., list Mar. 30, 1889	60 & 10 & 70%	
Sargent & Co., list 1.5% to 10 & 70%	60 & 10 & 70%	
Warner's Burglar Proof, \$1.00, \$3.00, \$6.00	net prices	
Yale		
Elevator	884 & 2%	
Padlocks		
Wrought Iron Padlocks:		
Brittan, Graham & Mathes, list Jan. 1894	75%	
Mallory, Wheeler Co., list January 1, 1894	75%	
Norwich Lock Mfg. Co., list June 10, 1891	50 & 25%	
Russell & Erwin Mfg. Co., list June 10, 1891	50 & 25%	
Sargent & Co., list January 1, 1894, 75%	50 & 25%	
William Wilcox Mfg. Co., list January 1, 1894	75 & 20%	
Ames Sword Co. up to No. 150	10%	
Ames Sword Co. above No. 150	50%	
Barnes Mfg. Co.	40 & 40 & 10%	
Champion Padlocks	10%	
A. E. Deltz	10%	
Eagle	10%	
Eureka, Eagle Lock Co.	40 & 25%	
E. T. Fraim's Keystone Scandia	10 & 10 line	
10 & 10 line	90 & 55%	
120 line	90 & 55%	
100 line	65%	
50 line	70 & 10%	
225, 610 and 200 lines	70%	
All other numbers	50 & 55%	
Horseshoe	9 dos \$9.50 to \$10 & 10%	
Hotchkiss	30%	
No. 1	30%	
Bomer's Nos. 0 to 91	30%	
Bomer's Scandinavian, &c., Nos. 100 to 505	15%	
Scandinavian	90 & 50%	
Slaymaker, Barry & Co.	10, 1010 line	
10 & 10 line	50%	
No. 61 line	60%	
No. 21 line	80%	
Star	60%	
Yale Lock Mfg. Co.'s	net prices	
Sash, &c.		
Attwell Mfg. Co.	25 & 33 1/2%	
Champion Safety list January, 1893, 70 & 65%		
Clark's No. 1, \$10; No. 2, \$3 gr.	33 1/2%	
Common Sense, Jap'd, Cop'd and Br'zed	10 gr. \$4.00	
Common Sense, Nickel Plated	10 gr. \$10.00	
Corbin's Daisy, list Feb. 15, 1886	70%	
Davis Bronze, Barnes Mfg. Co.	60%	
Ferguson's	33 1/2%	
Fish (Lieches' pat.), No. 100, 10 gr. \$8.		
No. 105, 10 gr. \$10.	50%	
Giant, list Jan. 1892	70 & 55%	
Hammond's Window Springs	40%	
Hugunin's New Sash Locks	25 & 25 & 25%	
Hugunin's Sash Balance	25 & 25 & 25%	
Huges' Patent	60 & 10 & 5 to 60 & 10 & 10%	
Kempshall's Gravity	60%	
Kempshall's Model	60 & 60 & 10%	
Monarch	50%	
Payson's Perfect	60 & 10 & 10 & 10%	
Reading	60 & 10 & 10 & 60 & 10 & 10%	
70%		
Universal	30%	
Victor	60 & 10 & 2%	
Walkers	10%	
Wolcott's	60 & 10 & 2%	
Lumber Tools		
See Tools, Lumber.		
Lustro		
Four-ounce bottles	1.75	
gross	\$17.00	
Machines.		
Boring		
Without Augers, Upright, Angular.		
Boss, Carpenter's	3.60	
Boss, Ship Builders	3.85	
Douglas	65.50 to 87.75	50%
Jennings	5.50 6.75	50 & 50 & 55%
Millers Falls	7.50	25%
Phillip's Patent	7.00 7.50	25%
Snell's, Rice's Pat	5.50 6.75	40 & 10 & 10%
Fluting		
American, 5 in., \$3.00; 6 in., \$3.40; 7 in., \$4.50 each		
Combined Fluter and Sash Iron	35%	
\$ dos 15.00	30%	
Crown, 4 1/2 in., \$3.50; 6 in., \$4.00; 8 in., \$5.50 each		
Crown Hand Fluter, Nos. 1, \$15.00; 2, \$12.50; 3, \$10.00; 4, \$8.25	35%	
Crown Jewel, 6 in., \$3.50 each	30%	
Domestic Fluter	each, \$1.50	
Eagle, 8 1/2 in. Rolls, \$2.15	35%	
Eagle, 5 1/2 in. Rolls, \$2.85	35%	
Geneva Hand Fluter, White Metal	\$ dos 12.25	
Knox, 5 1/2 in. Rolls	\$ dos 2.25 each	35%
Knox, 6 1/2 in. Rolls	\$ dos 3.60 each	35%
Shepard Hand Fluter	No. 8, \$6 per doz	
\$15.50	40%	
Shepard Hand Fluter No. 95, 10	\$8.00	
Shepard Hand Fluter, No. 110, 10	\$11.00	
40%		
Hoisting		
Moore's Anti-Friction Differential Pulley Block	20%	
Moore's Hand Hoist, with Lock Brake	20%	
Moore's Rope Differential Pulley Block	20%	
Marls & Beekley (Teal Patent)	30%	
See also Blocks.		
Washing		
Fair and Square	\$ dos \$42.00	
Anthony Wayne, \$ dos No. 1, \$42; No. 2, \$38; No. 3, \$42.		
Wayne American	\$ dos \$36.00	
Welsell	\$ dos \$46.00	
Western Star	\$ dos No. 2, \$26; No. 3, \$39	
Mallets		
B. & L. Block Co., Hickory & L. V.	30 & 10 & 40 & 10%	
Tibre Head, Stearns	33 1/2%	
Hickory	20 & 10 & 20 & 10 & 10%	
Lignumvitae	20 & 10 & 20 & 10 & 10%	
Mattocks	Regular list.	
60 & 10 & 60 & 10 & 5%		
Measures		
standard Fibreware, No. 1, peck \$3.00		
\$4.00		
\$4.50		
\$5.00		
\$5.50		
\$6.00		
\$6.50		
\$7.00		
\$7.50		
\$8.00		
\$8.50		
\$9.00		
\$9.50		
\$10.00		
Meat Cutters		
See Cutters, Meat.		
Menders, Harness		
Per doz.	\$2.00	
Milk Cans	—See Cans, Milk.	
Mills		
Coffee		
Box and Side, List, Jan. 1, 1888	80 & 60 & 5%	
Net prices are often made which are lower than above discount.		
American, Enterprise Mfg. Co., list Jan. 17, 1893	20%	
National List, Jan. 1, 1894	30%	
Swift, Lane Bros.	30%	
Waddel's New Box Mills, Ideal Brand, New List	60%	
Mincing Knives		
See Knives, Mincing.		
Molasses Gates		
See Gates, Molasses.		
Money Drawers		
See Drawers, Money.		
Mowers, Lawn		
Highest, 10 in., 12 in., 14 in.		
grade, \$4.00 & 1.25	\$4.50 @ \$6.00	\$5.00 @ \$6.75
Good	\$3.00	\$3.25
Cheap	2.25	2.50
Muzzles		
Safety	\$ dos \$8.00, 25%	
Nails		
Cut and Wire	See Trade Report.	
Wire Nails, Papered		
Association list, May 1, '92, 85 & 10 @		
85 & 10 & 5%		
Hungarian, Finishing, Upholsterers, &c.		
See Taaks.		
Horse		
Nos. 6 7 8 9 10		
A. C. 25¢ 23¢ 22¢ 21¢ 21¢	40 & 10 & 10%	
Champion	25¢ 23¢ 22¢ 21¢ 20¢	10 & 10 & 10%
Champlain	28¢ 26¢ 25¢ 24¢ 23¢	10 & 5 & 5%
Clinton, Fin. 19¢ 18¢ 17¢ 16¢ 16¢	10 & 10 & 10 & 10 & 10%	
Empire Bronzed	25¢ 23¢ 22¢ 21¢ 21¢	5 & 10 & 5%
Essex	28¢ 27¢ 26¢ 25¢ 24¢	25 & 25 & 25%
Lyra	9¢ 9¢ 9¢ 9¢ 9¢	net
Maud S.	25¢ 23¢ 22¢ 21¢ 21¢	10 & 10 & 10 & 10 & 10%
Northwest'n.	25¢ 23¢ 22¢ 21¢ 20¢	25 & 25 & 25%
Putnam	23¢ 21¢ 20¢ 19¢ 18¢	15 & 15%
Standard	23¢ 21¢ 20¢ 19¢ 18¢	15 & 15%
Vulcan	23¢ 21¢ 20¢ 19¢ 18¢	25%
Western	23¢ 21¢ 20¢ 19¢ 18¢	50%
Picture		
Cold Punched	5.00 5.10 off list	
Hot Pressed	5.50 5.80 off list	
In packages of 100 doz, add 1-10%		
In packages less than 100 doz, add 1/2 doz		
Nail Pullers	—See Pullers, Nail.	
Nail Sets	—See Sets, Nail.	
Nut Crackers		
See Crackers, Nut.		
Nuts	—List Dec. 18, 1889.	
Square, Hex.		
Cold Punched	5.00 5.10 off list	
Hot Pressed	5.50 5.80 off list	
In packages of 100 doz, add 1-10%		
In packages less than 100 doz, add 1/2 doz		
Oakum		
Best or Government	\$ dos 65 @ 73 1/2	
Navy	\$ dos 55 @ 65 1/2	
U. S. Navy	\$ dos 55 @ 65 1/2	
Oil Tanks	—See Tanks, Oil.	
Oilers		
Brass and Copper	50 & 10 & 50 & 10 & 5%	
Zinc and Tin	70 & 10 & 10 & 10%	
Broughton's Brass	30%	
Broughton's Zinc	30%	
Malleable, Hammered, Improved, No. 1, \$3.00; No. 2, \$4.00; No. 3, \$4.40		
10 @ 10 & 5%		
Malleable, Hammers' Old Pattern, same list		
Olmstead's Brass and Copper	30%	
Olmstead's Tin and Zinc	30%	
Prior's Pat. or "Paragon" Brass	30%	
Prior's Pat. or "Paragon" Zinc	30%	
Monarch	60 & 10 & 10%	
New Lightning	5.50	
Oriole	4.00	
Penn	3.00	
Perfection	4.00	
Pomona	4.00	
Reading 72	4.25	
Reading 78	6.00	
Rocking Table	6.00	
Turn Table	4.50	
Victor	13.50	
Waverly	4.00	
White Mountain	4.00	
Potato		
Antrim Combination	\$ dos \$5.50	
Hoosier	\$ dos \$13.50	
Saratoga	\$ dos \$5.50	
White Mountain	\$ dos \$4.50	
Pencils, Soapstone		
See Crayons.		
Pickers, Fruit		
Prize Fruit Pickers	50%	
Picks		
Railroad or Adze Eye, 5 to 6, \$12.00; 6 to 7, \$13.00; 60 & 10 & 5 to 60 & 10 & 5%		
Picture Nails		
See Nails, Picture.		
Pinking Irons		
See Irons, Pinking.		
Pins		
Bow		
Humason, Beckley & Co.	60 & 10%	
Peck, Stow & W. Co.	50 & 10 & 50 & 10 & 5%	
Sargent & Co.'s \$17 and \$18.	60 & 10%	
Prior's Pat. or "Paragon" Zinc	50%	
Brass		
Iron, list Nov. 11, 1885	75%	
List April 18, 1889.		
1/4 and under, Plain	57 1/2 & 10 & 10 & 10%	
1/4 and under, Galv.	50 & 10 & 10 & 10%	
1/4 and over, Plain	67 1/2 & 10 & 10 & 10%	
1/4 and over, Galv.	57 1/2 & 10 & 10 & 10%	
Boiler Tubes, list Oct. 24, 1892		
65 & 10 & 10 & 10 & 10%		
Casing, list 1st, 16, 1892	52 1/2 & 10 & 10 & 10 & 10%	
Drawn Seamless Steel Tubing	56%	
Inserted Joint Casing, list Nov. 16, 1892	47 1/2 & 10 & 10 & 5%	
Steel Boiler Tubes	27 1/2 & 10 & 10 & 5%	
Planes and Plane Irons		
Wood Planes		
Molding	40 & 10 & 50%	
Bench, First quality	45 & 10 & 50%	
Bench, Second quality	50 & 10 & 60 & 5%	
Bailey's (Stanley R. & L. Co.)	50 & 10 & 10%	
Iron Planes		
Bailey's (Stanley R. & L. Co.)	50 & 10 & 10%	
Birmingham Plane Co.	50 & 10 & 50%	
Chaplin's Iron Planes	50 & 10 & 50%	
Davis' Iron Planes	50 & 10 & 50%	
Gage Tool Co.'s Self-Setting	20 & 10 & 10%	
Meriden Mfg. Iron Co.'s	50 & 10 & 50 & 5%	
Miscellaneous Planes (Stanley R. & L. Co.)	25 & 10%	
Sargent's	50 & 10 & 10%	
Standard Tool Co.	50 & 10 & 10%	
Steers' Iron Planes	50 & 50 & 5%	
Plane Irons		
Auburn Thistle	50 & 10 & 30 & 10 & 10%	
Buck Bros.	50 & 10 & 30 & 10 & 10%	
Butcher's	50 & 10 & 30 & 20 & 10	
Ohio	50 & 10 & 30 & 10 & 10	
Sandusky	50 & 10 & 30 & 10 & 10	
Presses		
Fruit and Jelly		
Enterprise Mfg. Co.	35.50	
Henri		
Shepard's Queen City	40%	
Silver & Co.	35.75	
Pruning Hooks and Shears	—See Shears.	



**Snaps, Harness, &c.**  
 Anchor T. & S. Mfg. Co. .... 65  
 Andrews. .... 50  
 Covert's Saddlery Works' Triumph. .... 55  
 Covered Spring. .... 60&10&10%  
 Covert's New. .... 60&10&5&2%  
 Covert, New Patent. .... 50&10&5&2%  
 Covert, New R. E. .... 60&10&5&2%  
 Fitch's (Bristol). .... 10%  
 German, new list. .... 40&10%  
 Hotchkiss. .... 10%  
 Kelley & Woolworth's Steel Harness. .... 50&10&6%  
 John Prota Snaps. .... 75&75&5%  
 Sargent's Patent Guarded. .... 70&10&10%

**Snaths—**

See Irons, Soldering.

**Spiroons Cuspidors, &c.**

Standard Fiberware

Cuspidors, 3½ inch, ½ doz., No. 5; No. 5½, 50.

Spiroons, Daisy, 8-inch, No. 1, 10 and 11 inch, 50.

**Spoke Shaves—**

See Shaves, Spoke.

**Spoke Trimmers—**

See Trimmers, Spoke.

**Spoons and Forks—**

Tinned Iron

Basting, Cen. Stamp. Co.'s list. .... 70&25%

Buffalo, S. S. & Co. .... 55&25%

Solid Table and Tea, Cen. Stamp. Co.'s list. .... 70&25%

**Silver Plated—**

4 months or 55 cash 30 days:

L. Boardman & Son. .... 50&12&6%

Holmes & Edwards Silver Co. .... 40, 15&15%

Meriden Brit. Co., Rogers. .... 40&15%

Reed & Barton. .... 40&10&15%

Rogers & Bros. .... 40&15%

C. Rogers & Bros. .... 40&15%

Rogers & Hamilton. .... 40&15%

Wm. Rogers Mfg. Co. .... 40, 15&15%

Simpson, Hall, Miller & Co. .... 40, 15&15%

**Miscellaneous—**

Boardman's Britannia Spoons, 55 cash

lots. .... 60&5&5%

Britannia. .... 60&60&6%

German Silver. .... 50&50&5%

Nickel Silver. .... 50&5&10&5%

Holmes & Edwards Silver Co.:

No. 24 German Silver. .... 50&10&5%

No. 30 Silver Metal. .... 50&10&5%

No. 48 Nickel Silver. .... 50&10&5%

No. 50 Nickel Silver. .... 50&5%

No. 57 Mexican Silver. .... 50&10&5%

Rogers & Hamilton:

Cimeta, Flatware. .... 40&15&5%

Cimeta, Steel Goods. .... 40&15%

Crown Hamilton, Flatware and Cutlery. .... 30%

Steel Goods. .... 40&15%

Wm. Rogers Mfg. Co.:

185 Rogers' German Silver. .... 80&6%

225 Rogers' Nickel Silver. .... 50&5%

Rogers' Silver Metal. .... 50&10&5%

**Springs—Door—**

Champion (Coll.). .... 60&10&60&10&10%

Cowell's, No. 1, ½ doz. \$18.00, No. 2, \$15.00

Gem (Coll.), list April 19, 1886. .... 20%

Hercules. .... 50&50&10&10%

Phoenix. .... 38&4%

Rubber, complete. .... 50&45. .... 55&10&5%

Star (Coll.), list April 19, 1886. .... 20&10&10%

Torrey's, Rod, 39 in. .... ½ doz. \$1.20&1.25

Warner's No. 1, ½ doz. \$1.50, No. 2, \$3.40

Victor (Coll.). .... 60&10&60&10&5%

**Carriage, Wagon, &c.—**

Elliptic, Concord, Platform and Half Scroll. .... 60&10&60&10&10 or net prices

Quinn's Bolster Springs. .... 25%

**Sprinklers, Lawn—**

Gibbs' Arc. .... ½ doz. \$12.00

Gibbs' Hustler. .... ½ doz. \$6.00

**Squares—**

Nickel-Plated. .... 80&10&10&10&5%

Steel and Iron. .... 80&10&10&10&5%

Try Square and T Bevels. .... 60&10&10&5%

Avery's Bevel Protractor. .... 50%

Avery's Flush Bevel Squares. .... 40%

Diaston's Try Square and T Bevels. .... 50%

Starrett's Micrometer Caliper Squares. .... 25%

Winterbottom's Try and Miter. .... 30&10%

**Squeezers—**

Fodder

Blair's. .... ½ doz. \$2.00

Blair's "Olimax". .... ½ doz. \$1.25

**Lemon—**

Porcelain Lined, No. 1. .... ½ doz. \$6.00

Wood, Common. .... ½ doz. \$1.70&1.75

Wood, No. 2. .... ½ doz. \$3.00, 35%

Dean's., No. 1, ½ doz. \$5.00; 2, \$3.35, 5%

\$1.00; Queen, \$2.50

Dunlap's Improved. .... ½ doz. \$2.75, 20%

Hotchkiss Straight Flash. .... ½ doz. \$2.00

Jennings' Star. .... ½ doz. \$2.50

King. .... 40&5%

Little Giant. .... 50&50&5%

Bammls. .... No. 1, \$5.00; No. 2, \$9.12

\$18. ½ doz. 25&10%

Silver & Co., Glass. .... ½ gro. \$9.00

The Boss. .... ½ doz. \$2.50

**Standard Fiber Ware—**

See Ware, Standard Fiber.

**Staples—**

Barbed Blind, ½ in. and larger. .... 50&5&5%

Barbed Blind, ½ in. .... 50&5&5%

Same price

Fence Staples, Galvanized, as B'rb Wire

Fence Staples, Plain. .... See T'd. R. Co.

Grand Crossing Tack Co.'s list. .... 75&10%

**Steelyards Butchers'—**

C. & A. Hoffmann's. .... 40%

Nichols Bros. .... 40&10&20%

**Steelyards Stocks and Dies—**

Blacksmith's:

Butterfield's Goods. .... 35%

Waterford Goods. .... 35%

Gardner. .... 35%

Green River. .... 35%

Lightning Screw Plate. .... 25&30%

Reece's New Screw Plates. .... 25&30%

Reversible Ratchet. .... 30%

**Stone—**

Stones, Grind—See Grindstones.

Scythe Stones—

Pike Mfg. Co., list April, 1892. .... 85&4%

Sweden Stone Co., list N. J. V. 1892. .... 85&4%

**Oil Stones, &c.—**

Pike Mfg. Co.:

Hindostan No. 1, ½ lb. .... 84

Sand Stone. .... 80

Turkey Oil Stone, 4 to 8 in. .... 40 & 40% 10%

Turkey Slips. .... 50

Lily White Washita. .... 60

Rosy Red Washita. .... 60

Washita Stone, Extra. .... 50

Washita Stone, No. 1. .... 40

Washita Stone, No. 2. .... 30

Lily White Slips. .... 90

Rosy Red Slips. .... 90

Washita Slips, Extra. .... 80

Washita Stone, No. 1. .... 70

Arkansas Stone, No. 1, 3 to 5 in. .... 2.80

Arkansas Stone, No. 1 ½ to 8 in. .... 3.50

Lake Superior. .... 1.50

Lake Superior Slips. .... 1.20

Tanite Mills:

Emery Oil. .... ½ doz., \$9.00. 50&10&5%

**Stops, Bench—**

Cincinnati. .... 25&10%

Crescent. .... ½ doz., \$5, 10&10&5%

Hotchkiss. .... 10&10&5%

McGills. .... ½ doz. 83

Millers Falls. .... 25

Morrill's. .... ½ doz., \$10.00. No. 2, \$11.00

Stearns'. .... 20&10&10%

Terrell's Nos. 1 and 2. .... ½ doz., \$3. 3.50

Weston's. .... \$1. 1.50

**Stove Polish—**

See Polish, Stove.

**Stretchers Carpet—**

Cast Iron, Steel Potats. .... ½ doz. 75&80

Cast Steel, Polished. .... ½ doz. 82&85

Socket. .... ½ doz. 1.75

Bullard's. .... 35&25&10%

**Straps Razor—**

Badger's Belt and Com. .... ½ doz. \$2.00

Campbell Cutlery Co. .... Net prices

Electric Cutlery Co. .... Net prices

Genuine Emerson. .... 60&60&5%

Imitation. .... ½ doz. \$2.00. 20&10&5%

Jordan's Pat. Padded, list Nov. 1, '89. 50%

Lamont Combination. .... ½ doz. \$4.00

Torrey's. .... Net prices

**Sweepers, Carpet and Lawn—**

See Carpet, Sweepers.

**Tools—****Coopers'—**

Albertson Mfg. Co. .... 25%

Barton's. .... 20&20&20%

Beatty's. .... 30

Bradley's. .... 20

Sandusky Tool Co. .... 30&30&30%

Shaves Cincinnati Tool Co. .... 20

L. & J. White. .... 20&5%

**Lumber—**

Cant Hooks, "Blue Line". .... ½ doz. \$16.00

Cant Hooks, Common Finish. .... ½ doz. 14.00

Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish. .... ½ doz. 15.00

Cant Hooks, Mall. Socket Clasp, Common Finish. .... ½ doz. 14.50

Cant Hooks, Clip Clasp, "Blue Line" Finish. .... ½ doz. 14.00

Cant Hooks, Clip Clasp, Common Finish. .... ½ doz. 12.00

Hand Spikes. .... ½ doz. 6 ft. \$16.00; 12 ft. \$20.00

Pike Poles, Pike & Hook. .... ½ doz. 12 ft. \$11.50; 14 ft. \$12.50; 16 ft. \$14.50;

18 ft. \$17.50; 20 ft. \$21.50

Pike Poles, Pike only. .... ½ doz. 12 ft. \$1.00. 12 ft. \$1.20. 20 ft. \$1.50

Pike Poles, not ironed. .... ½ doz. 12 ft. \$1.00; 14 ft. \$1.20; 16 ft. \$1.50

Spikes. .... ½ doz. 12 ft. \$1.00; 14 ft. \$1.20; 16 ft. \$1.50

Mall. Iron Socket Peavies. .... ½ doz. \$19.00

Ring Peavies, "Blue Line". .... ½ doz. \$20.00

Ring Peavies, Common. .... ½ doz. \$18.00

Ring Peavies. .... ½ doz. \$21.00

Ring Peavies. .... ½ doz. \$21.00

Setting Poles. .... ½ doz. 12 ft. \$14.00; 14 ft. \$15.00; 16 ft. \$17.00

Swamp Hooks. .... ½ doz. \$18.00

**Saw—**

Atkins', new list. .... 40%

Simonds'. .... 33&1/2%

**Transom Lifters—**

See Lifter, Transom.

**Traps—****Game—**

Blake's Patent. .... 40&10&50%

Newhouse. .... 40&10&50&5%

Oneida Pattern. .... 75&75&10&5%

**Mouse and Rat—**

Cyclone. .... ½ gr. \$5.25

Dandy. .... ½ doz. \$1.75

Hotchkiss Metallo Mouse. .... 5-6 traps, ½ doz. 75; in full cases, ½ doz. 60&65

Hotchkiss Imp. Rat Killer. .... ½ gr. gro. \$18.50

Hotchkiss New Rat Killer. .... ½ gr. gro. \$18.50

**Fly—**

Balloon, Globe or Acme. .... ½ doz. \$1.50; 1.50

Leathered Tacks. .... ½ doz. 1.50

Leathered Tacks. .... ½ doz. 1.50

Leathered Tacks. ....

**Whips**

American Whip Co.: Length, 4 ft	5	5½	6	6½	7	7½	8 ft.
X. L. Whalebone Driving	\$18.00	20.00	22.00	24.00	27.00	30.00	33.00 36.00
Eureka, Two-thirds Whalebone	15.00	16.50	18.00	20.00	21.00	23.00	26.00
Bull Bone, Half-length Whale bone							
American Standard	8.00	8.50	11.00	12.00	15.00	18.00	16.50
True Grip, Raw Hide Center	6.00	6.00	6.50	7.00	7.50	9.00	10.00
New Name, Stocked Java, Black and Wine Colors							
American, 93 Pen Whip							
Gents' Light Driving No. 111							
Gents' Light Driving No. 106							
Hand-made Stocked Java No. 103			8.75	4.00			
A large variety of cheaper grades							
Team Whips							
Toy Whips							
Hardware Assortment, 10/American, 75 Whips for \$60.00							

Per dozen.

**Steel Music Wire, 12 to 30, imported...**

60¢@70¢	W. D.
Stubs' Steel Wire	36.00 to 2.30¢
Tate's Spooled, Tind' & Annealed	60¢@5¢
Tate's Spooled Cop. and Brass	50¢
Tinned Broom Wire, 18 to 21, W. D.	45¢
Wire Clothes Line, see Lines.	
Wire Picture Cord, see Cord.	

**Bright Wire Goods—**

Standard list	90¢@90¢@15%
Painted Screen Cloth	100 ft \$1.40@\$1.45

**Painted Screen Cloth**

80¢@80¢@10¢@5¢

**Wire Barb—**

See Trade Report.

**Wire Rope—See Rope, Wire.****Wrenches—**

American Adjustable

40¢

Baxter's Adjustable "S"

40¢@20¢@5¢

Baxter's Diagonal

60¢

Coes' Genuine

50¢@50¢@10¢

Coes' "Mechanics"

50¢@10¢@5¢

Girard Standard

65¢@10¢@70¢

Lamson &amp; Sessions' Engineers

60¢@10¢@5¢

Lamson &amp; Sessions' Standard

70¢@10¢@5¢

Girard Agricultural

75¢@10¢@5¢

Lamson &amp; Sessions' Agric'l.

75¢@10¢@5¢

P. S. &amp; W. Agricultural

80¢@5¢

W. &amp; B. Diamond

50¢@5¢

Acme, Bright

40¢@2¢

Acme, Nickeled

40¢@2¢

**Aiken's Pocket (Bright)**

\$6.00, 50¢@10¢

**Alligator**

50¢

**Always Ready**

25¢@10¢

**Bear's Claw**

35¢@5¢

**Adjustable S.**

35¢@5¢

**Brig's Pattern**

30¢@10¢

**Combination Black**

40¢@10¢

**Combination Bright**

40¢@10¢

**Cylinder or Gas Pipe**

45¢@5¢

**Extra Heavy**

45¢@5¢

**Merrick's Pattern**

45¢@5¢

**No. 3 Ply Bright**

55¢@5¢

**Bit Wrench, Adj. Tatum's**

50¢@2.25¢@25¢@10¢

**Boardman's**

30¢

**Cinclidium Brace Wrenches**

25¢@10¢

**Diamond Steel**

55¢@5¢

**Donohue's Engineer**

20¢@10¢

**Eagle**

50¢@10¢

**Hercules**

70¢@70¢@10¢

**Taft's Vice Wrench**

55¢@10¢@8¢

**The Favorite Pocket**

5¢@1.00, 40¢

**Walker's**

55¢@5¢

**Webster's Pat. Combination**

25¢@5¢

**Wringers, Clothes**

Am. Wringer Co.'s list, July 1, '88, 2¢ cash

Colby Wringer Co., list Sept. 1, '89, 2¢ cash

Lovel Mfg. Co., list July 1, 1892, 2¢ cash

Peerless Mfg. Co., list Feb. 1, 1892, 2¢ cash

National Wringer &amp; Mfg. Co., list June 1, 1892, 2¢ cash

Wrought Goods—

Staples, Hooks, &amp;c., list, March 17, 1892, 3¢@10¢@8¢@5¢@1¢@1¢

## Paints, Oils and Colors.—Wholesale Prices.

**Animal and Vegetable Oils—**

Linseed, City, raw, per gal.	52	60
Linseed, City, boiled	55	60
Linseed, Western, raw	50	60
Linseed, Western, boiled	63	60
Lard, City, Extra Winter	62	60
Lard, City, Extra No. 1	62	60
Lard, City, Extra	50	45
Lard, Western, prime	27	28
Cotton-seed, Crude, prime	27	28
Cotton-seed, Crude, off grades	25	28
Cotton-seed, Summer Yellow	32	33
Cotton-seed, Summer Yellow	31	32
Sperm, Crude	63	63
Sperm, Natural Spring	68	65
Sperm, Bleached Spring	68	70
Sperm, Natural Winter	68	70
Sperm, Bleached Winter	73	75
Whale, Crude		
Whale, Natural Winter	44	
Whale, Bleached Winter	47	
Whale, Extra Bleached	49	
Sea Elephant, Bleached Winter		
Menhaden, Crude, Sound	26	27
Menhaden, Crude, Southern		
Menhaden, Light Pressed	33	
Menhaden, Bleached Winter	37	
Menhaden, Extra Bleached	40	
Tallow, City, prime	45	47
Tallow, City, Western prime	43	45
Cocoanut, Ceylon	54	54
Cocoanut, Cochin	64	64
Cod, Domestic	38	40
Cod, Foreign	40	43
Red Elaena	35	38
Red Saponified	42	43
Bank	36	36
Straits		
Olive, Italian, bbls.	58	62
Neatsfoot, prime	60	65
Palm, prime, Lagos	54	54

**Mineral Oils—**

Black, 29 gravity, 25 @ 50 cold test	per gal	7	8
Black, 29 gravity, 15 cold test		7	8

Litharge, kegs	54	54
Litharge, bbls. and ½ bbls.	54	54
Ocher, Rochelle	1.85	1.85
Ocher, French Washed	1.60	1.60
Ocher, German Washed	1.40	1.40
Ocher, American	1.20	1.20
Orange Mineral, English	7.75	8
Orange Mineral, French	10	10
Orange Mineral, German	7.75	8
Red, Indian, English	5	5
Red, Indian, American	2	2
Red, Turkey	9	10
Red, Tuscan	7	10
Red, Venetian, American	1.00	1.00
Red, Venetian, English	1.10	1.35
Sienna, Italian, Burnt and Raw	4	5
Sienna, Italian, Burnt	4	5
Powd. W. D.	4.20	2.25
Sienna, Ital. Burnt, Lumps	4.20	3.75
Sienna, Ital. Raw, Powd.	4.20	3.75
Sienna, Ital. Raw, Lumps	4.20	3.75
Sienna, American, Raw	1.75	1.75
Sienna, American, Burnt and Raw	1.75	1.75
Powdered	1.40	1.50
Talc, French	1.40	1.40
Talc, American	1.00	1.00
Terra Alba, Fr. Ch.	100 D.	65
Terra Alba, English	65	75
Terra Alba, American No. 1	65	75
Terra Alba, American No. 2	45	50
Umbre, Turkey, Burnt and Raw	2.10	3.10
Umbre, Turkey, Burnt	2.10	3.10
Powdered	2.10	3.10
Umbre, Turkey, R. W. Lumps	2.10	3.10
Umbre, Turkey, B. N. Amer.	1.40	1.25
Umbre, Turkey, R. W. Amer.	1.40	1.25
Yellow, Chrome	10	12
Vermillion, American Lead	11	12
Vermillion, Quicks'r, bulk	43	40
Vermillion, Quicks'r, bags	44	40
Vermillion, Quicks'r, sm't pks.	52	40
Vermillion, English Import	55	60
Vermillion, Imitation, Eng.	8	30
Vermillion, Trieste	90	95
Vermillion, Chinese	85	100
Whiting Common	40	45
Whiting Gilders	50	55
Zinc, American, dry	8.10	7.50
Zinc, French, Red Seal	7	9

**Clue—**

Low Grade

7 @ 9

Cabinet

11 @ 14

Medium White

12 @ 14

Extra White

16 @ 20

French

10 @ 22

English

10 @ 15

Irish

10 @ 12½

**RATES OF SUBSCRIPTION: INCLUDING POSTAGE.****UNITED STATES AND BRITISH AMERICA.**

Weekly Edition, Issued every THURS-DAY morning, . . . . . \$4.50 a year.

Semi-Monthly Edition, FIRST and THIRD THURSDAYS of every month, . . . . . \$3.30 "

Monthly Edition FIRST THURSDAY of every month, . . . . . \$1.15 "

**RATES OF ADVERTISING:** ONE SQUARE (12 LINES, ONE INCH).

SIX MONTHS, - - - - - \$80.00

ONE YEAR, - - - - - 50.00

Rates for larger spaces quoted on application.

DAVID WILLIAMS, Publisher.

THOMAS HOBSON, Manager.

ROBERT A. WALKER, Manager.

{ J. K. HANES, Business Manager.

{ GEO. W. COPE, Resident Asso. Ed.

HENRY SMITH, Manager.

H. H. ROBERTS, Manager.

WALTER C. ENGLISH, Manager.

EZRA S. ADAMS, Manager.

BRITISH AGENCY: Office of *The Ironmonger*, 42 Cannon St., London.

AUSTRALIAN OFFICES: Melbourne, 231 Elizabeth St.; Sydney, 420 George St.

Remittances should be made by draft, payable to the order of DAVID WILLIAMS, on any banking house in the United States or Europe, or by P. O. Money Order on New York. When these cannot be obtained, postage stamps of any country will be received.

Newspapers or Booksellers in any part of the world may obtain *The Iron Age* through The American News Company, New York, U. S. A. The International News Company, New York, U. S. A., and London, England; or The San Francisco News Company, San Francisco, Cal., U. S. A.

Entered at the Post Office, New York as Second-Class Matter.

## CURRENT METAL PRICES.

APRIL 18, 1894.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

## IRON AND STEEL-

## Bar Iron from Store-

Common Iron:	
1/2 to 2 in. round and square. . . . .	2 lb 1.60 @ 1.70
1 to 6 in. x 3/8 to 1 in. . . . .	2 lb 1.70 @ 1.90
Refined Iron:	
1/2 to 2 in. round and square. . . . .	2 lb 1.70 @ 1.90
1 to 4 in. x 3/8 to 1 1/2 in. . . . .	2 lb 1.80 @ 2.00
4 to 6 in. x 3/8 to 1 in. . . . .	2 lb 1.90 @ 2.00
1 to 6 in. x 1/2 and 5/8 in. . . . .	2 lb 1.80 @ 1.90
Rods—6 and 11-16 round and sq. . . . .	2 lb 1.80 @ 1.90
Bands—1 to 6 x 3-16 to No. 12. . . . .	2 lb 2.00 @ 2.10
"Burden Best" Iron, base price, 2 lb . . . . .	2.30
Burden's "H. B. & S." Iron, base price. . . . .	2.60
"Ulster". . . . .	2.80
Norway Bars. . . . .	3.50 @ 3.75
Norway Shapes. . . . .	4.00 @ 4.50

## Merchant Steel from Store—

Per lb

Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots. . . . .	2 1/2
Best Cast Steel, base price in small lots. . . . .	7 1/2
Best Cast Steel Machinery, base price in small lots. . . . .	4 1/2

## Sheet Iron from Store—

## Black—

Best Refined Iron.	
Nos. 14 to 20. . . . .	2.90
21 to 24. . . . .	3.00
25 to 28. . . . .	3.10
27. . . . .	3.20
28. . . . .	3.40

Common 1/4 less than the above.

## Open Hearth Steel.

Best Soft Steel, Nos. 14 to 16. . . . .	2 1/4 @ 2 5/8
" " " 18 to 20. . . . .	2 1/4 @ 3 1/2
" " " 21 to 24. . . . .	3 1/2 @ 3 1/4
" " " 25 to 28. . . . .	3 1/2 @ 3 3/8
" " " 27 to 28. . . . .	3 1/2 @ 3 3/8

Best Bloom Sheets, 1/4 extra over above prices. Best Bloom, Galvanized, jobbing dis. 70 @ 70 &amp; 5/8. Ordinary Bessemer, 1/8 @ 1/4 lower than above prices.

## Russia, Planished, &amp;c.

Genuine Russia, according to assortment. . . . .	2 lb 11 3/4 @ 12
Patent Planished. . . . .	2 lb A. 10; B. 9 1/2
Craig Polished Sheet Steel. . . . .	2 lb 8 1/2

## Foreign Steel from Store

Best Cast. . . . .	2 lb 15
Extra Cast. . . . .	2 lb 16 @ 17
Swaged, Cast. . . . .	2 lb 16
Best Double Shear. . . . .	2 lb 15
Blister, 1st quality. . . . .	2 lb 12
German Steel, Best. . . . .	2 lb 10
2d quality. . . . .	2 lb 9
3d quality. . . . .	2 lb 8
Sheet Cast Steel, 1st quality. . . . .	2 lb 15
2d quality. . . . .	2 lb 14
3d quality. . . . .	2 lb 12 1/2
R. Musket's "Special". . . . .	2 lb 48
" " " " " Annealed. . . . .	2 lb 75
" " " " " Titanic. . . . .	2 lb 20
McKen's Special No. 8. . . . .	2 lb 30
" " " Extra. . . . .	2 lb 15

## METALS

Tin—Per lb

Banca, Pigs. . . . .	21 1/4 @ 2
Straits, Pigs. . . . .	20 1/4 @ 21
Straits in Bars. . . . .	22 1/4 @ 22 1/4

## Tin Plates—

Duty: 2 2/4 lb.

Charcoal Plates—Bright—Guaranteed Plates command special prices, according to quality. . . . .	Per box.
Melyn and Calland Grade, IC. 10 x 14. . . . .	2 lb 6.50
" " " " " IC. 12 x 12. . . . .	6.75
" " " " " IC. 14 x 20. . . . .	6.50
" " " " " IC. 20 x 28. . . . .	13.00
" " " " " IC. 10 x 14. . . . .	8.75
" " " " " IC. 12 x 12. . . . .	8.75
" " " " " IC. 20 x 28. . . . .	17.00
" " " " " DC. 12 x 17. . . . .	6.00
" " " " " DX. 12 x 17. . . . .	8.00
Allaway Grade. . . . .	
" " " " " IC. 10 x 14. . . . .	6.00
" " " " " IC. 12 x 12. . . . .	6.25
" " " " " IC. 14 x 20. . . . .	6.00
" " " " " IC. 20 x 28. . . . .	12.00
" " " " " IX. 10 x 14. . . . .	7.25
" " " " " IX. 12 x 12. . . . .	7.50
" " " " " IX. 14 x 20. . . . .	7.25
" " " " " IX. 14 x 28. . . . .	14.50
" " " " " DC. 12 x 17. . . . .	5.50
" " " " " DX. 12 x 17. . . . .	6.75

## Coke Plates—Bright—

Col. Coke.—IC. 10 x 14, 14 x 20. . . . .	2 lb 5.50
10 x 20. . . . .	8.25
IX. 10 x 14, 14 x 20. . . . .	6.75
IX. 10 x 14, 14 x 20. . . . .	5.50
BV Grade—IC. 10 x 14, 14 x 20. . . . .	5.50

## Charcoal Plates—Terne—

Guaranteed Plates command special prices according to quality. . . . .	
Dean Grade.—IC. 14 x 20. . . . .	2 lb 5.85
20 x 28. . . . .	11.00
IX. 14 x 20. . . . .	8.40
20 x 28. . . . .	12.80

Abecarne Grade.—IC. 14 x 20. . . . .	2 lb 5.50
20 x 28. . . . .	10.75
IX. 14 x 20. . . . .	6.40

## Tin Boller Plates—

AXX, 14 x 26. . . . .	12 sheets. . . . .
XXX, 14 x 28. . . . .	12 sheets. . . . .
XXX, 14 x 31. . . . .	12 sheets. . . . .

## American Terne Plates—Apollo—

IC. 14 x 20. . . . .	2 lb 25
IC. 20 x 28. . . . .	12.50
IX. 14 x 20. . . . .	7.25
IX. 20 x 28. . . . .	14.50
IX. 20 x 28. . . . .	14.50

## Copper—

Duty: Pig, Bar and Ingot, 1 1/4 lb; Old Copper, 1 lb. Manufactured (including all articles of which Copper is a component of chief value), 35% ad valorem.

## Ingot—

Lake. . . . .

Ansonia grade Arizona. . . . .

Ansonia grade Casting. . . . .

Prices adopted by the Association of Copper Manufacturers of the United States, March 22, 1894. Stubs' gauge standard.

Net.

Sheet and Bolt—

Prices adopted by the Association of Copper Manufacturers of the United States, March 22, 1894. Stubs' gauge standard.

Net.

Weights per sq. foot and prices per pound.

Not wider than	And longer than	Weights per sq. foot and prices per pound.									
		Over 32 oz.	32 to 24 oz.	24 to 16 oz.	16 to 12 oz.	12 to 8 oz.	8 to 6 oz.	6 to 4 oz.	4 to 2 oz.	2 to 1 oz.	1 oz.
30-72	14	14	14	15	16	17	20	22	—	—	—
30-72	14	14	14	15	17	19	23	—	—	—	—
36-96	14	14	14	16	18	22	25	—	—	—	—
48-96	14	14	15	17	19	23	27	—	—	—	—
48-96	14	14	16	18	20	24	—	—	—	—	—
60-96	14	14	17	19	21	25	—	—	—	—	—
60-96	14	15	20	—	—	—	—	—	—	—	—
84-96	15	16	—	—	—	—	—	—	—	—	—
Over 84 in. wide	17	19	—	—	—	—	—	—	—	—	—

Bolt Copper, 3/8 inch diameter and over, 2 lb. Circles, Segments and Pattern Sheets, 60 in. diameter and less, 32 oz. ad valorem over price of Sheet Copper required to cut them from. Circles, Segments and Pattern Sheets, over 60 in. diameter, up to 96 in. diameter inclusive, 48 oz. ad valorem over prices of Sheet Copper required to cut them from.

Circles, Segments and Pattern Sheets, over 96 in. diameter, 56 oz. ad valorem over prices of Sheet Copper required to cut them from.

Cold or Hard Rolled Copper 1/4 oz. per square foot and heavier, 16 oz. per over the foregoing prices.

Cold or Hard Rolled Copper lighter than 1/4 oz. per square foot, 24 oz. per over the foregoing prices.

All Polished Copper over 20 in. wide, 24 oz. per over the foregoing prices.

Circles less than 8 inches diameter are not classed as Copper Bottoms.

Copper Wash Bowl Bottoms—Tinned.

Tinning—Net.

Tinning sheets on one side, 10, 12 and 14 x 48 each.

Tinning sheets on one side, 30 x 60 each. . . . .

For tinning boiler sizes, 9 in. (sheets 14 in. x 60 in.) each. . . . .

For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.) each. . . . .

For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.) each. . . . .

Tinning sheets on one side, other sizes per square foot. . . . .

For tinning both sides double the above prices.

Plated Brass and Copper—Not larger than 30 x 60.

16 oz. and heavier. . . . .

14 oz. . . . .

12 oz. . . . .

Seamless Brass Tubes—Standard—Guaranteed always Stubs' gauge, unless otherwise ordered.

July 12, 1893. Net.

O. G. N. G. % % % % % 1

O. G.	N. G.	%	%	%	%	%	%	1
8-14	6-12	32	28	25	24	23	22	19
	15	33	28	26	25	24	23	20
	16	34	29	27	26	25	24	21
	17	35	30	28	27	26	25	22
	18	37	31	29	27	26	25	23
	19	38	32	30	29	27	26	24
	20	39	34	32</				

---

This is a reproduction of a library book that was digitized by Google as part of an ongoing effort to preserve the information in books and make it universally accessible.

Google™ books

<https://books.google.com>

